



Water Supply Study

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TABLE OF CONTENTS

COMMUNITY AND SYSTEM OVERVIEW	1
BACKGROUND INFORMATION.....	2
Basics of Groundwater.....	2
Lack of Adequate Data Regarding the Long-Term Sustainability of Groundwater	
Supplies	3
Groundwater Resources, Village Of Barrington	3
Sand and Gravel Aquifers	4
Silurian Dolomite Aquifer	4
Cambrian-Ordovician Aquifers	5
Village Of Barrington Potable Well System.....	5
Well # 1	6
Well # 2	6
Well # 3	6
Well # 4	6
GROUNDWATER PUMPAGE AND EXISITING CONDITIONS	8
Current Conditions	8
Historical Data.....	9
Peak Demand	11
Water Levels	15
Observations	17
FUTURE CONDITIONS	18
Current Conditions and Approved Development in the Village Area	18
Potential Future Development through 2030 in the Village Area	18
Summary	19
WATER CONSERVATION	20
Water Conservation Conditions	21
Scenario A – Seasonal (Calendar) Based Water Use Limitation Program.....	22
Scenario B – Statistical (Aquifer Level) Based Water Use Limitation Program...	22
DEVELOPMENT OF WATER SUPPLY ALTERNATIVES	23
Regional Alternatives	23
Alternative A – Interconnection with the City of Elgin	24
Alternative B – Northwest Suburban Municipal Joint Action Water Agency	
(NSMJAWA) Connection	25
Alternative C – Northwest Water Commission (NWC) Connection	25
Alternative D – Fox River Intake and Water Treatment Plant.....	26
Alternative E – Village of Hoffman Estates Interconnection	26
Regional Surface Water Options	27

TABLE OF CONTENTS (continued)

Local Alternatives	28
Alternative F – Installation of One Pair of New Shallow Village Wells.....	28
Alternative G – Utilization of Existing Fair Haven Wells	28
Alternative H – Installation of New Deep Village Wells	29
EVALUATION OF ALTERNATIVES.....	31
Lake Michigan Allocation	31
Evaluation of Alternatives.....	31
Evaluation of Potential Sites for The Installation Of New Wells	32
The Illinois Groundwater Protection Act.....	32
Potential Well Site D - Library Water Tower.....	34
Potential Well Site I – One (1) MG Standpipe Water Tower Location.....	34
RECOMMENDATIONS.....	36

TABLES

Table 1	Average Daily Water Production
Table 2	Evaluation of Regional Alternate Water Supplies
Table 3	Local Alternatives
Table 4	List of Potential Well Sites

FIGURES

Figure 1	Average Daily Water Production
Figure 2	Daily per Capita Water Use
Figure 3	Daily Water Production – July 2002
Figure 4	Daily Water Production – June 2005
Figure 5	Average Annual Precipitation
Figure 6	Comparison of Pumping Rates and Precipitation

APPENDICES

Appendix A	Regional and Local Alternatives
Appendix B	Cost Summary Tables
Appendix C	Illinois Department of Natural Resources Lake Michigan Water Allocation Evaluation

COMMUNITY AND SYSTEM OVERVIEW

The Village of Barrington (Village) is located approximately 40 miles northwest of the City of Chicago, and divided between Lake County and Cook County, Illinois. It is generally bounded to the north by Cuba Township and the Cuba Marsh Forest Preserve; to the south by the Village of Inverness; to the east by the Village of Deer Park, the Village of Palatine and the Deer Grove Forest Preserve; and to the west by the Village of Barrington Hills.

The Village provides water to customers located in Barrington and small portions of Inverness and Barrington Hills. The Village currently uses groundwater that it pumps from four (4) underground well sites to the distribution system which contains three (3) water storage reservoirs, three (3) elevated water storage tanks, one (1) pressure boosting station, one (1) pressure reducing station and one (1) iron filtration facility.

The Village of Barrington contracted with Burns & McDonnell Engineering Company, Inc. (BMCD) in October 2005 for a water supply study. The scope of work presented in this study includes the following:

- Review of available water supply information from the Village;
- Review of available regional information;
- Determination and confirmation of existing Village water supply capacity including review of historical reports, well logs and operational data;
- Review and recommendations of procedural and institutional public and private sector water use practices that will result in reducing demand on the Village system;
- Development and evaluation of local and regional alternatives for optimizing and/or increasing water supply capacity;
- Preparation of a report that presents alternatives for consideration by the Village that presents the findings of the study.

This report presents background information and the results of the water supply study prepared for the Village of Barrington.

* * * *

BACKGROUND INFORMATION

Basics of Groundwater

The following is a brief overview of important terminology needed to discuss the basics of groundwater. *Groundwater* is water that saturates tiny underground voids (i.e., interstitial spaces) between sand, gravel, silt, clay particles or crevices in underground rocks, or as defined by the State of Illinois, “water that occurs within the saturated zone in geologic materials where the fluid pressure in the pore space is equal to or greater than the atmospheric pressure.” Formations that contain groundwater may be “consolidated” bedrock, such as limestone or sandstone, or they may be “unconsolidated” deposits made up of sand and gravel. The relative volume of interstitial spaces is referred to as *porosity*. The size and interconnections of interstitial spaces control how well water flows in the subsurface. This characteristic of a formation is referred to as its *permeability*.

Groundwater is any water that is found in the subsurface. Some of that water is in aquifers and some is in aquitards. Aquifers are underground formations that are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams. *Confined aquifers* (also known as artesian aquifers) exist where groundwater is confined between layers of clay, silts, dense rock or other materials having very low permeabilities; which are referred to as *aquitards*. Water in confined aquifers is under greater pressure than that exerted by the atmosphere. Thus, when tapped by a well, water is forced up above the top of the aquifer, and sometimes above the ground surface. *Unconfined shallow water table aquifers* are not overlain by impermeable layers and the surface of the water is at atmospheric pressure. Aquitards limit the movement of water significantly, but there is still water present in them. Aquitards in the upper Midwest are generally comprised of clay and silt deposits, shales, and unfractured limestone.

Unconsolidated sand and gravel aquifers generally can extend from just below the ground surface to depths of several hundred feet (generally less than 300 feet). Residences, farms and water utilities tap the sand and gravel aquifers because the water is relatively close to the surface making it fairly easy and inexpensive to drill wells and pump water. However, the amounts of water that these aquifers can yield vary a great deal. Some may barely supply one well on a small farm, while others may supply entire communities.

Below the unconsolidated deposits are various bedrock formations comprised of limestones or sandstones that can function as aquifers. Factories, businesses, homes, farms and water utilities tap these aquifers.

Groundwater originates from rainfall and surface water that percolates through the soils until it reaches the saturated zone in the subsurface: a process known as *recharge*. In some areas, streams, wetlands or

lakes recharge aquifers through bed infiltration. In some locations, the rainfall simply moves downward through the soils. The areas that contribute water to aquifers are called *recharge zones*.

In other cases, water flows from the aquifers to the surface in the form of springs or seeps into streams, lakes or wetlands. These are called *discharge zones*. The water surface in the stream, lake or wetland may or may not be a reflection of the aquifer water table depending on the local hydrogeological conditions. The portion of the stream flow comprised of groundwater is called *baseflow*.

The amount of groundwater that is available to the aquifers is a function of the recharge zone's climate. In the case of northern Illinois, the climate is relatively wet with approximately 36 inches of rainfall per year. When a rainfall event occurs, a large portion of it is lost to evaporation, transpiration, and surface flows that leave the area. Approximately 25 percent of the precipitation makes it to the subsurface where it is available to recharge the groundwater.

The sustainable yield of an aquifer is the amount of water that may be safely pumped from an aquifer over a long period of time without causing overall declines in water levels. The sustainable yield is mainly controlled by the amount of groundwater recharge the aquifer receives. If total discharge (i.e., natural discharge plus water use for human activities) exceeds the recharge rate, water levels within the aquifer will drop. This decline will continue until a new balance is reached, or until the groundwater in an aquifer is depleted to the point where further withdrawals are no longer feasible.

Lack of Adequate Data Regarding the Long-Term Sustainability of Groundwater Supplies

There is a recognized lack of comprehensive data for analyzing the current and historical extent of groundwater quantity and quality problems in the State of Illinois. The State of Illinois recently released an Executive Order (EO) on, January 9th, 2006 ordering a statewide water supply study and the development of regional plans.

At this time it is difficult to determine what direction implementation and funding will take. Planning organizations like the Barrington Area Council of Governments (BACOG) are studying local groundwater conditions and have initiated discussions with local municipalities.

Groundwater Resources, Village Of Barrington

Three major local aquifer systems are available to supply the Barrington area communities that rely on groundwater. These aquifers include the unconsolidated sand and gravel, the shallow Silurian dolomite bedrock and the deep Cambrian-Ordovician sandstone bedrock. The Village of Barrington currently draws water from the unconsolidated sand and gravel aquifer and the shallow Silurian dolomite aquifer. A nearby community that utilizes the deep Cambrian-Ordovician sandstone bedrock is the Village of Lake Zurich.

The characteristics and geographic extent of these aquifers are very different from each other. There are many sand and gravel aquifers in the area; all of which are locally recharged and tend to be limited in size to a few square miles or less. The Silurian dolomite aquifer is regionally several hundred square miles in size, but tends to be locally recharged. Based on available publications from the Illinois State Water Survey, the Silurian dolomite aquifer is located in the central and northern portions of the Village and pinches out in the southern portion of the Village. There are two primary Cambrian-Ordovician sandstone aquifers that are available to the region. Because of the nature of these aquifers' confining layers, they are primarily recharged in far western McHenry County, Boone County and Winnebago County.

Additional information on each of these aquifers is presented in the following paragraphs.

Sand and Gravel Aquifers – Sand and gravels deposited by glaciers supply a portion of the water used in most Lake County and McHenry County municipalities. Many homes and businesses in these counties have private wells. These unconsolidated deposits are generally within 200 feet of the ground surface and are scattered throughout the area. Yields from sand and gravel wells vary greatly from location to location and can range from 10 to 1,400 gallons per minute (gpm) depending on the transmissivity, thickness and depth of the aquifer. Village of Barrington Municipal Wells # 3 and # 4 located on Bryant Avenue draw water from the sand and gravel aquifer.

Water quality in terms of iron, manganese, hardness, and sulfate concentrations can vary greatly in the sand and gravel aquifers. Generally treatment for removal of iron is needed to make the water aesthetically pleasing. The sustainable yields of the many isolated sand and gravel aquifers have not been estimated in most locations. These aquifers may be at risk of contamination in areas where there are no layers of impermeable materials such as clays and silts above the formation. Fortunately, a significant impermeable clay and silt layer exists above the sand and gravel aquifer in the Village of Barrington area that mitigates the impact of any surface water impacts.

Silurian Dolomite Aquifer - The Silurian dolomite shallow bedrock aquifer is a significant source of water to consumers located in the Village of Barrington service area. Wells completed in this formation are usually 100 to 300 feet deep and may produce as much as 800 gpm with yields in the range of 300 gpm being common. Because the movement of water in dolomite aquifers is dependent primarily on water flow within fractures, yields will vary greatly from location to location. The sustainable yield of this formation has not been estimated. Village of Barrington Municipal Wells No.1 and Well # 2 located on the Village Hall Site are supplied by the Silurian dolomite aquifer.

Water quality in terms of iron, manganese, hardness, and sulfate concentrations varies somewhat in this aquifer. Generally treatment consisting of aeration for removal of sulfur is needed to make the water aesthetically pleasing. The shallow bedrock aquifer may be susceptible to contamination from the surface

in areas where layers of impermeable materials such as clays and silts are not present in the unconsolidated glacial deposits above the bedrock. Fortunately a significant impermeable clay and silt layer exists above the Silurian dolomite aquifer in the Village of Barrington area mitigating any surface water impacts on the aquifer.

Cambrian-Ordovician Aquifers – The deep bedrock Cambrian-Ordovician sandstone aquifers are primary sources of groundwater in Cook, DuPage, Lake, and McHenry Counties. The common names for these aquifers are the St. Peter sandstone and the Galesville sandstone. Wells reaching this important aquifer system are typically 800 to 1,300 feet deep. Since the mid-20th century, withdrawal rates from the Cambrian-Ordovician aquifers have exceeded their estimated sustained yield. In 1979, withdrawals from the aquifers in the eight county area in Northeastern Illinois reached an all-time high of approximately 182 million gallons per day (mgd). The Illinois Department of Natural Resources State Water Survey (ISWS) estimates that the practical sustained yield of the aquifer is only in the range of 46 to 65 mgd. By 1980, the heavy pumping had caused water levels in the deep bedrock aquifers to decline by more than 850 feet from their original levels.

In the 1980s, Lake Michigan water became more accessible to suburban communities in Lake, Cook and DuPage counties, and withdrawals from the St. Peter and Galesville sandstone aquifers dropped to 67 mgd. The ISWS reported that water levels in these aquifers rebounded by an average of approximately 15 feet per year between 1991 and 1995. Withdrawals totaled 71 mgd in 1998. Though totals between 1994 and 1998 represented a substantial decline in withdrawals from the 1979 peak, the withdrawal rate continues to exceed the estimated 46 to 65 mgd practical sustained yield of the deep bedrock system. While estimates of the deep bedrock aquifer's practical sustained yield have not been updated in a number of years, it nonetheless appears that the deep bedrock aquifer should not be relied upon as a sustainable source of additional water to accommodate the region's future water demands.

The potential for contamination by migration of chemicals into the sandstone aquifers from the land surface is very low. However, other contaminant pathways such as abandoned wells may pose a threat to the groundwater quality in the deep bedrock. The St. Peter and Galesville aquifers are also known to contain high concentrations of naturally occurring barium and radium at some locations.

Village Of Barrington Potable Well System

This section discusses the components of the Village of Barrington water system. Presently the Village's water supply is being met by utilizing four existing wells. The wells are generally located within a 1-mile radius of the Village's central business district. The wells are identified as Community Wells # 1 through # 4. Groundwater is being pumped from the Silurian dolomite shallow bedrock aquifer by a well cluster consisting of Well # 1 and Well # 2. Groundwater is being pumped from the thick unconsolidated (sand and gravel) deposits by a well cluster consisting of Well # 3 and Well # 4. Since these well clusters are not located within close proximity to each other, they do not interfere with each other and can be used

simultaneously to supply water to the Village's service area. These wells supplied a total of approximately 657 million gallons of water in 2005. A brief description of each well is presented in the following paragraphs.

Well # 1 – Well # 1, finished in the Silurian dolomite aquifer, was completed in 1898 to a depth of approximately 305 feet. The well is located adjacent to Village Hall. The well has the capacity of producing approximately 800 gallons per minute (gpm) which is equivalent to approximately 1.15 million gallons per day (mgd). In 2005, Well #1 produced approximately 210 million gallons (MG) which represented approximately 32% of the annual production for the Village in 2005. The pump is currently set at 137 feet with an average running level at approximately 112 feet.

Well # 2 – Well # 2, finished in the Silurian dolomite aquifer, was completed in 1929 to a depth of approximately 210 feet. The well is located approximately 150 feet from Well # 1 near Village Hall. The well has a reported pumping capacity of approximately 550 gpm which is equivalent to approximately 0.8 mgd. In 2005, Well #2 produced approximately 82 MG, which represented approximately 12.5 % of the annual production in the Village. The pump is set at 120 feet with an average running level at approximately 98 feet (last reported in 1991).

Well # 3 – Well # 3, finished in the unconsolidated sand and gravel aquifer, was completed in 1964 to a depth of approximately 148 feet. The well is located on Bryant Street and has a reported pumping capacity of approximately 1,200 gpm or 1.7 mgd. In 2005, Well #3 produced approximately 292 MG, which represented approximately 44.5% of the annual production in the Village. During the peak months of May through August, 2005, Well #3 supplied 45% of the total Village water production. The pump is currently set at approximately 125 feet with an average running level at approximately 103 feet.

Well # 4 – Well # 4, finished in the unconsolidated sand and gravel aquifer, was completed in 1974 to a depth of approximately 151 feet. The well is located on the corner of Bryant and Waverly Streets and has a reported pumping capacity of 1,400 gpm or 2.02 mgd. In 2005, Well #4 produced approximately 72 MG, which represented approximately 11% of the annual production in the Village. The pump is set at approximately 135 feet with an average running level at approximately 109 feet.

It may be possible to increase the depths of the Village's existing wells; however we do not believe that increasing the well depth will result in a significant increase in pumping capacity for the following reasons:

- Well #1 and Well #2 are installed in the Silurian Dolomite aquifer. Wells installed in this aquifer are supplied by fractures in the Silurian Dolomite bedrock that allow groundwater to enter the well. These fractures are typically in the upper portion of the aquifer where the bedrock is less dense. Increasing the depths of a well in this aquifer does not typically result in a significant

increase in the number of fractures supplying the well; thus it does not typically result in a significant increase in well production.

- Well #3 and Well #4 are installed in the shallow sand and gravel aquifer at depths of 148 feet and 151 feet, respectively. Based on review of public information for Well #3 and Well #4, these wells are already installed at a depth that will maximize well production.

* * * * *

GROUNDWATER PUMPAGE AND EXISITING CONDITIONS

Based on water well production data provided by the Village of Barrington, the average daily water production rate from 2001 through 2005 was reported as approximately 1.7 million gallons per day. For comparison purposes the groundwater usage reported in the 1972 Baxter and Woodman Engineer's Report prepared for the Village was approximately 1.0 million gallons per day. The average volume of water supplied by the Village from 1996 through 2005 is approximately 70 percent greater than the volume of water supplied by the Village in 1972. Burns & McDonnell believes that the reasons for the increase include:

- Increase in the number of customers supplied by the Village.
- Increase in the water usage per capita per day by Village customers.
- Periods of below normal levels of precipitation over the last three years resulting in increased outdoor water usage.

Current Conditions

Over the last five years the Village has supplied an average of 612.1 million gallons of water per year (1.7 mgd) to its customers. We would not propose any significant improvements to the existing system to meet the existing "average" demand. However, a water system that is designed to supply only the average consumption would not be adequate to meet demand during peak periods.

Based on the production data, it is anticipated that during peak daily production the pumpage rate can be expected to be approximately 2 times the average daily pumpage, and peak hourly demand can be 3 times the average. Review of historical groundwater information indicates that the Village of Barrington can meet its current peak daily demand of approximately 3.4 mgd over a short duration of time (approximately one week). The Village can also meet its estimated current peak hourly demand of 5.1 mgd over a short duration of time (several days).

The Village currently has four individual wells that operate as two well clusters. The four wells have individual capacities totaling approximately 3,950 gpm (5.67 mgd); however the wells in each cluster cannot be operated simultaneously over an extended period of time without interference due to their proximity to each other. Well #1 and Well #2 are located approximately 100 feet apart. The zone of influence (cone of depression) of these wells overlaps when both wells are operated concurrently which is expected to result in a reduction in sustained combined capacity. Well #3 and Well #4 are located approximately 700 feet apart, and are also expected to experience a reduction in capacity when both wells are operated concurrently over an extended period of time. Insufficient data is available to predict exactly when the combined capacity of each well cluster will begin to decline; however based on experience Burns & McDonnell believes that it may be within several days.

Historical Data

Table 1 presents historical average daily water production and total annual water production by the Village for the period of 1983 through 2005.

TABLE 1

Average Daily Water Production				
Year	<u>Average Daily Pumped</u>		<u>Total Yearly Pumped</u>	
1983	1.290	MG	470.85	MG
1984	1.460	MG	532.90	MG
1985	1.504	MG	548.96	MG
1986	1.516	MG	553.34	MG
1987	1.726	MG	629.99	MG
1988	1.974	MG	720.51	MG
1989	1.720	MG	627.80	MG
1990	1.587	MG	579.26	MG
1991	1.741	MG	635.47	MG
1992	No Data Available			
1993	1.442	MG	526.33	MG
1994	1.520	MG	554.80	MG
1995	1.410	MG	514.65	MG
1996	1.623	MG	592.40	MG
1997	1.518	MG	554.07	MG
1998	1.627	MG	593.86	MG
1999	1.703	MG	621.23	MG
2000	1.573	MG	573.78	MG
2001	1.512	MG	551.88	MG
2002	1.700	MG	620.14	MG
2003	1.675	MG	611.38	MG
2004	1.696	MG	617.58	MG
2005	1.799	MG	656.78	MG
Average	1.605		585.987	
Max	1.974		720.510	
Min	1.290		470.850	

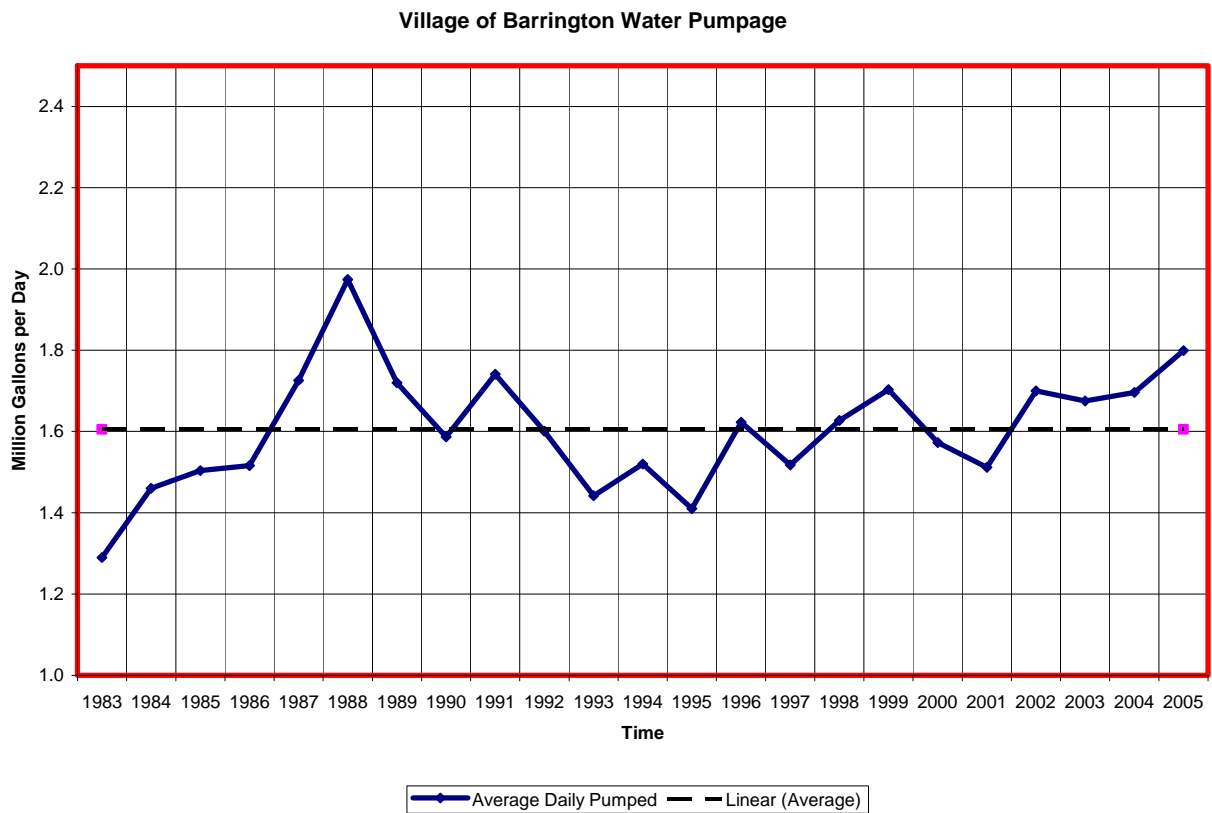


Figure 1 Average Daily Water Production.

Based on review of the data, the Village has produced an average of approximately 1.68 million gallons per day over the last five years. The average annual volume over the last five years is approximately 611.6 million gallons per year. This is an increase of approximately 1.3 percent when compared to the average of 586 million gallons per year over the last 23 years. Average daily water production over the last 23 years is presented in Figure 1.

Peak Demand

Figure 2 presents the daily per capita water use by Village consumers for the calendar years of 1999 through 2005. These rates are based on historical Well 1 through 4 pumping records provided by the Village and an **estimated 2005 current population served of 11,700** by the Village's water system. It is understood that the population of the area served by the Village has increased from 1999 to 2005, however the exact population served by the Village each year is not known. Use of the estimated current population of 11,700 allows for a reasonable comparison of per capita water use.

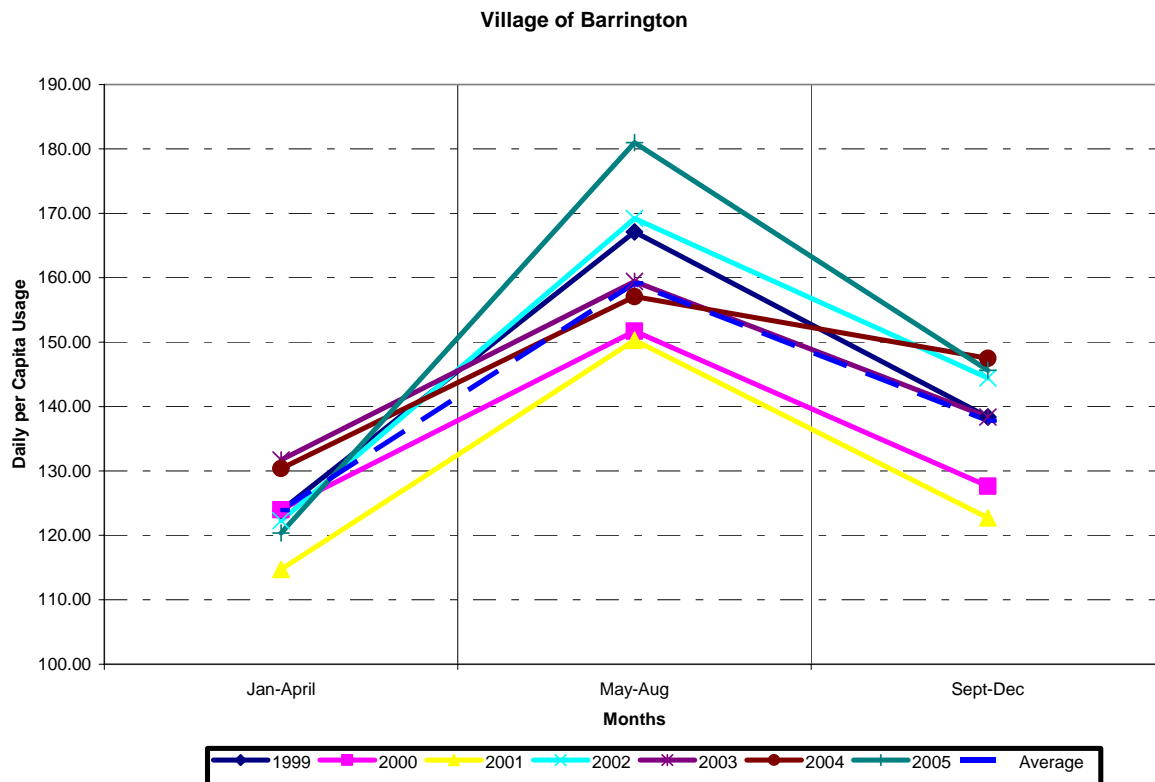


Figure 2 – Daily per Capita Water Use.

As shown in Figure 2, peak demand in the Village of Barrington occurred every year in the months of May through August. This trend suggests that use of water for outdoor purposes has a significant impact on water consumption rates in the area supplied by the Village.

The average daily per capita water use for the past year (2005), based on estimated service area population of 11,700, was approximately 154 gallons with a peak four month demand of 181 gallons per capita per day during the months of May through August. The per capita per day water use for the month of June was an exceptionally high 227 gallons. It is difficult to identify exactly what the increased usage

in the months of May through August is attributed to; however, it is generally believed that high lawn sprinkling/outdoor irrigation is the most likely source.

It is important to note that the Village of Barrington initiated watering restrictions in late June of 2005 as a result of severe drought conditions. A total prohibition on watering was enacted on July 20th 2005 and extended until August 12th, 2005 due to Well #3 being taken out of service (extremely low running level). Following August 12, 2005, the Village stayed in a CONDITION ORANGE as defined in Chapter 10: “Limitations on the Use of Water” of The Barrington Village Code until the end of November 2005. Analysis of this data indicates that the per capita use of 227 gallons in June 2005 was approximately 72 gallons per capita (46 percent) higher than the average per capita use of approximately 155 gallons during the month of August 2005. Weather conditions during August, 2005 did not significantly improve when compared to June, 2005 which indicates that water conservation had a significant impact on reducing water demand in the Village’s service area.

Since the Village’s existing wells operate as two well clusters, the current sustainable capacity of the wells ranges from approximately 2.5 mgd (Well #2 and Well #3 operating concurrently) to approximately 3.2 mgd (Well #1 and Well #4 operating concurrently). The combination of Well #2 and Well #4 operating concurrently provides a production rate at approximately 2.82. mgd and the combination of Well #1 and Well #3 is approximately 2.85 mgd.

Based on review of pumping data provided by the Village, the Village pumped a total of 79.3 million gallons in July 2002 and 79.6 million gallons in June 2005.

Daily water production for the months of July 2002 and June 2005 are presented in Figure 3 and Figure 4. As presented in these figures, the Village has experienced peak daily demands that have exceeded the production capacity of all well pumping combinations except the pumping combinations of Well #1 and Well #4 on multiple occasions. This indicates that the Village currently has only one pumping combination, Well #1 and Well #4, that can provide a sustainable water supply to meet Village needs during peak monthly demands.

Currently the Village has the capacity to meet its peak daily demands experienced as a monthly average; however it is not able to meet these demands with the pumping combination of Well #2 and Well #3 and meets the demands with only six percent (6%) excess capacity for the pumping combinations of Well #1 and Well #3 and Well #2 and Well #4. Therefore, it is recommended that the Village consider the installation of a new well cluster in the near future to provide redundancy in its ability to supply its consumers during peak demand periods.

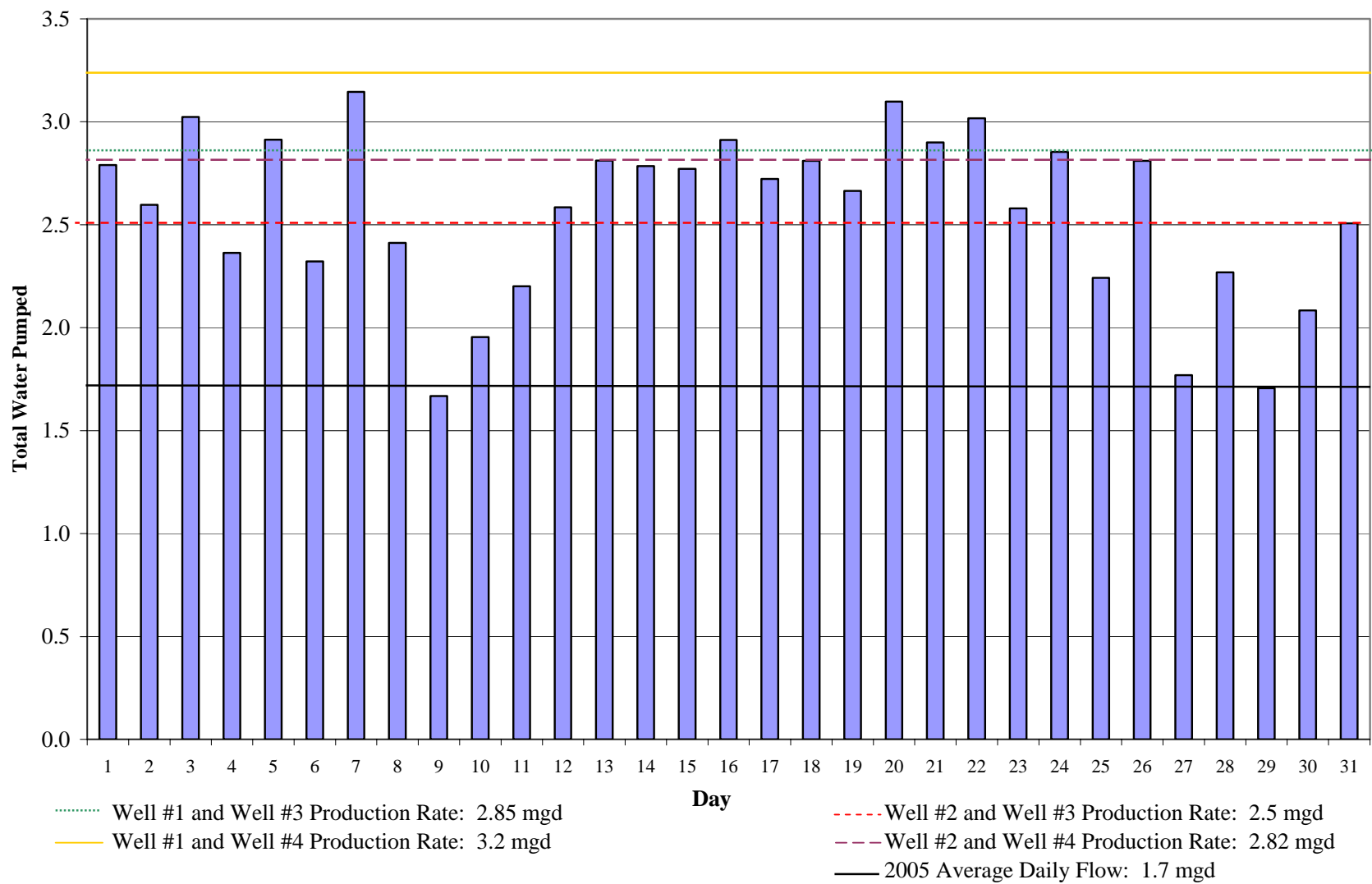


Figure 3 - Daily Water Production - July 2002

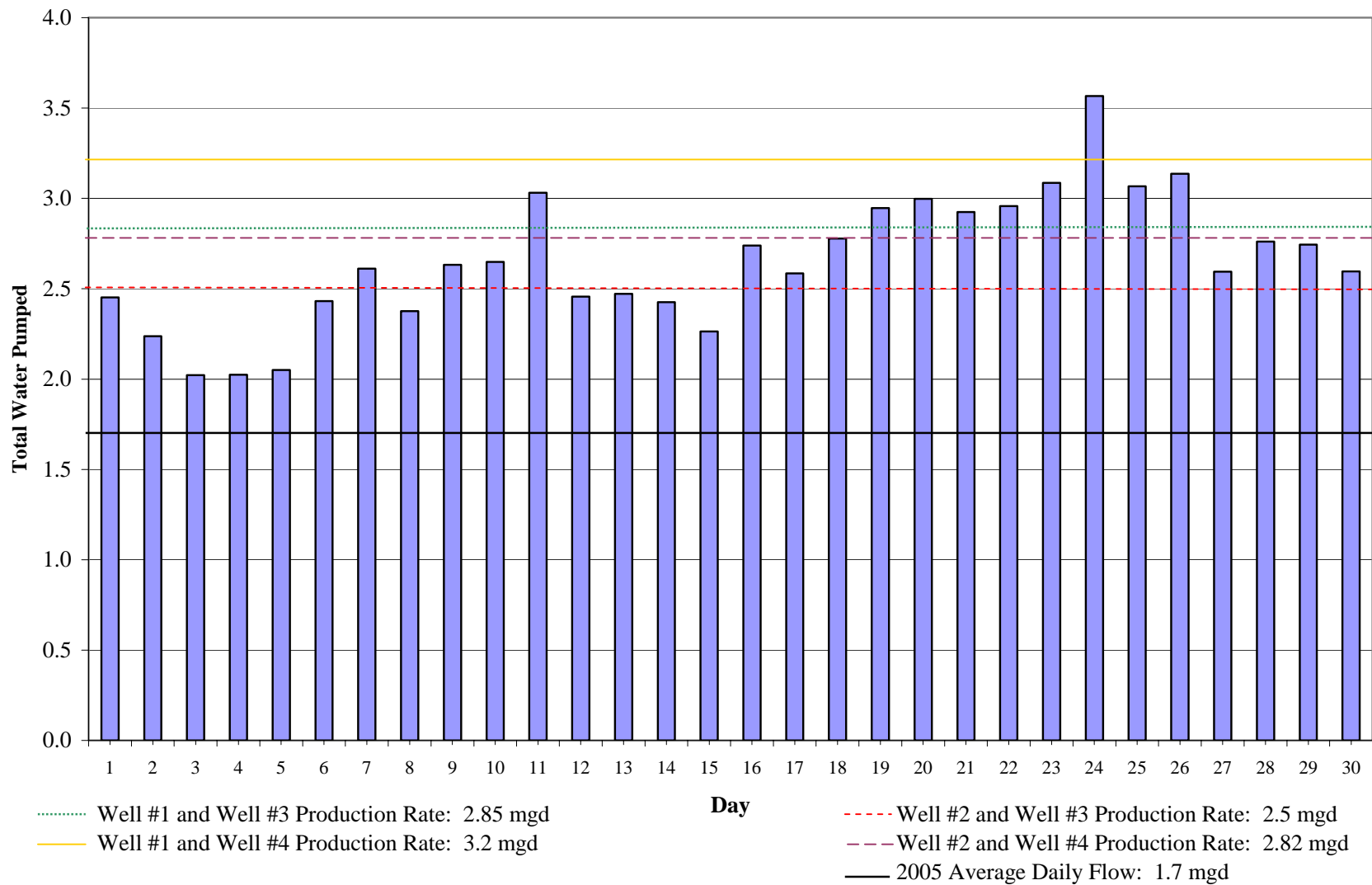


Figure 4 - Daily Water Production - June 2005

Water Levels

The water levels in Wells #1 and #2 have been receding at a rate of approximately $\frac{3}{4}$ inch per year since 1990. Similarly the water levels in Wells #3 and #4 have been receding at the rate of $1\frac{1}{4}$ inches per year. This is the result of continual withdrawal of water from the aquifers with a reduced amount of recharge due to lack of precipitation.

In response to receding water levels the Village has recently lowered the pump settings in Wells #3 and #4. The lowering of the pump settings in Wells #3 and #4 were included in the Village's 2005 fiscal year budget with planned completion in the fall of 2005. As a result of the drought conditions experienced in the summer of 2005, the lowering of the pump setting in Well #3 was accelerated and completed in July 2005. The lowering of the pump setting in Well #4 has been completed and rehabilitation of Well #2 including the lowering of the pump setting is planned for 2006. Burns & McDonnell concurs with the modifications made by the Village to Wells #3 and #4 and the planned rehabilitation of Well #2. These modifications have and will increase the capacity of the Village's existing groundwater well system.

As previously discussed, the amount of groundwater that is available to the aquifers is a function of the recharge zone's climate. In the case of northern Illinois, the climate is relatively wet with approximately 36 inches of rainfall per year. The annual precipitation recorded over the past three years indicates a deficit of roughly 4.6 inches per year on average with 2005 having a deficit of 9 inches. Of the rain that falls locally, a large portion of it is lost to evaporation, transpiration and surface flows that leave the area. Based on review of data, it appears that the deficit in precipitation over the last three years has had a significant impact on the amount of water used by Village customers. Figure 5 presents the annual precipitation in the Village of Barrington area from 1996 through 2005.

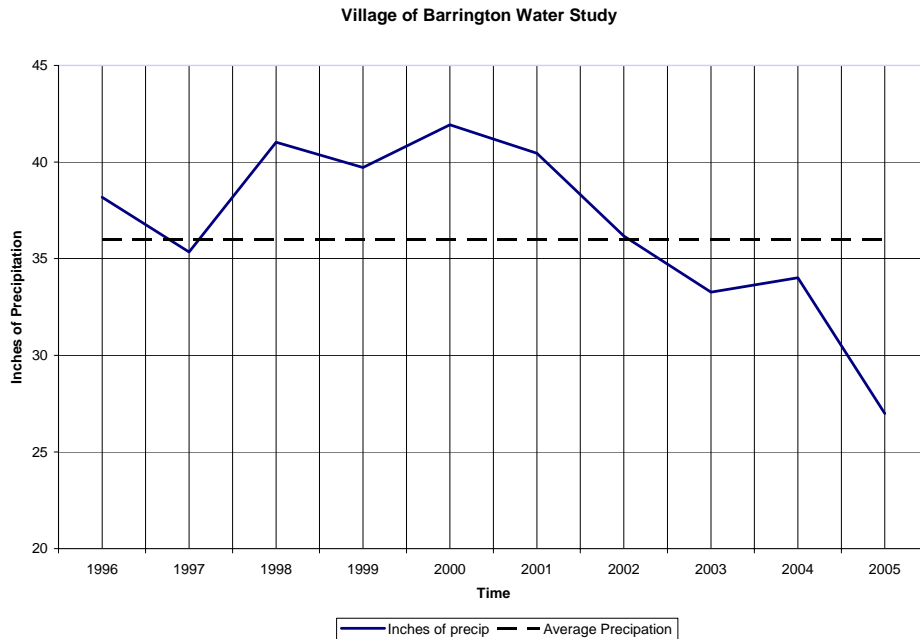


Figure 5 – Average annual precipitation

Figure 6 presents a comparison of the Village’s groundwater pumping rates and the amount of precipitation that has fallen in the area over the period of 1996 through 2005. It is important to note that only approximately 25% of total precipitation actually returns to the aquifers.

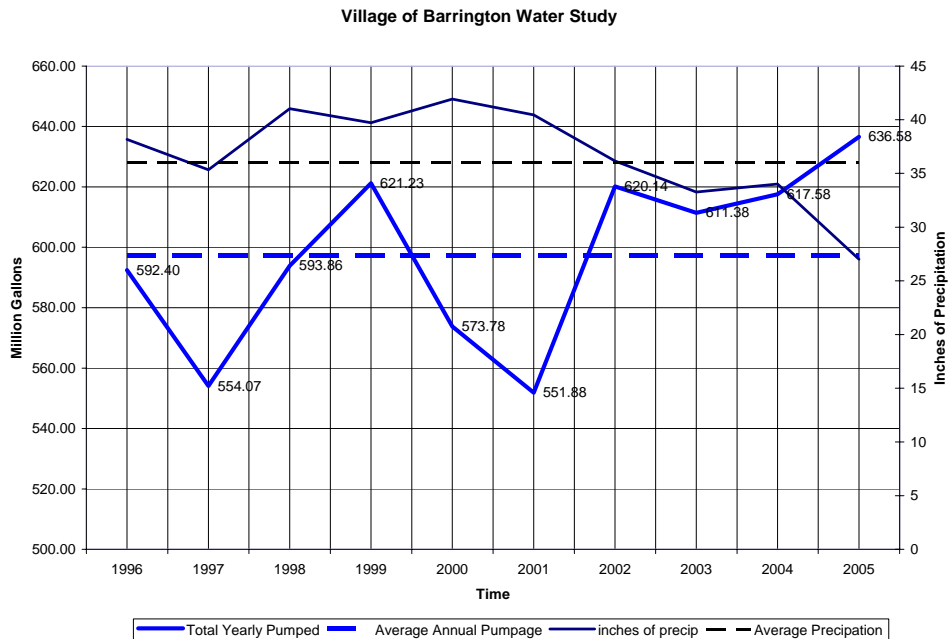


Figure 6 – Comparison of Pumping Rates and Precipitation

Observations

What is apparent from evaluating the water consumption and demand data for the water supply system is that the Village of Barrington is capable of providing sufficient quantities of water during non-peak and peak times to its existing consumers. This task is completed by effective system management of the existing supply and storage facilities. However, during periods of extended drought such as that experienced by the Village over the last three years, it is difficult for the Village to meet system demands without water conservation which can effectively reduce a community's water demand by 15 to 30 percent. It is our understanding that the Village has recently added water conservation measures to its ordinance. Following these practices will go a long way in managing the Village's current water resources.

Water consumption in the Village has increased every year since 2001. We believe this is due to an increase in outdoor water consumption, below normal levels of precipitation, an increase in the number of customers supplied by the Village and an increase in water usage per capita per day. In anticipation of this trend continuing, the Village should consider another water supply source capable of producing an average of approximately 1 mgd. We also believe that this additional source provides the Village with a needed contingency in the event that one of the two existing well clusters or one of the key wells, Well #1 or Well #4, experiences a reduction in capacity or becomes temporarily inoperable. This source could be a regional source such as Lake Michigan Water or the Fox River or a local groundwater source that does not interfere with zone of influence at the two existing pairs of wells in the Village.

* * * * *

FUTURE CONDITIONS

Based on data provided by the Village, a potential increase in the number of water customers is expected as a result of development through the year 2030. Based on evaluation of data, it is possible that the Village could be supplying water to approximately 13,800 people by 2030. The projected water consumption based on approved, planned and potential development local area that could be served by the Village could increase to an average of 2.25 mgd by 2030. The estimated average of 2.25 mgd is comprised of the following:

- 1.7 mgd in current water consumption;
- 0.15 mgd of additional water consumption by approved developments in the Village area; and
- 0.40 mgd of additional water consumption by potential future development through 2030 in the Village area.

Current Conditions and Approved Development in the Village Area

The average daily demand required to meet the estimated demand of current and approved development in the Village area is estimated to be 1.85 mgd. Based on production data, it is anticipated that during peak demand, the daily pumpage rate can be expected to be approximately 2 times the average daily pumpage, and peak hourly demand can be up to 3 times the average. In order to meet its current and approved development the Village will need to be able to provide a peak daily demand of approximately 3.7 mgd and peak hourly demand of approximately 5.55 mgd.

As stated previously, the Village currently has four individual wells that operate as two well pairs. The four wells have individual capacities totaling approximately 3,950 gpm (5.67 mgd); however the wells in a pair cannot be operated simultaneously over an extended period of time without interference due to their proximity to each other. We believe that with continued effective management of existing water resources and implementation of water conservation measures, the Village can meet the needs of its current demand and the anticipated demand from approved development in the Village. However, in order to provide contingency for increases in annual water consumption and needed redundancy in the event of a reduction in capacity or mechanical failure of one of the Village's existing pairs of wells or Well #1 or Well #4, it is recommended that the Village consider an additional water supply source capable of producing an average of approximately 1 mgd.

Potential Future Development through 2030 in the Village Area

Based on information provided by the Village, Burns & McDonnell estimates that potential future development through 2030 in the Village area could increase the required average water consumption in the Village to 2.25 mgd. This is an increase of 0.40 mgd when compared to the estimated demand of current conditions and approved development. In order to meet this demand it is estimated that the

Village will need to be able to provide a peak daily demand of approximately 4.5 mgd and peak hourly demand of approximately 6.75 mgd.

The Village will need to add an additional source(s) of supply to meet these demands. It is recommended that the Village consider adding an additional source(s) of water capable of providing an average of approximately 1.5 mgd to meet this demand. Additional storage may also be required.

The estimated future demand of 2.25 mgd through 2030 does not take into account a potential reduction in water consumption that could be achieved through implementation of water conservation measures.

It is anticipated that beyond 2030 the Village will experience some additional development. It is recommended that the Village continue to monitor anticipated development to determine if additional water supply will be needed.

Summary

Based on evaluation data, the Village of Barrington is capable of providing sufficient quantities of water during non-peak and peak times to meet the requirements of its existing consumers and approved developments. However, the Village is challenged to meet peak demands over short periods of time (multiple days). This task is currently completed by effective system management of the existing supply and storage facilities. In order to provide contingency for extended peak demand, increases in annual water consumption and needed redundancy of the existing supply it is recommended that the Village consider an additional water supply source capable of producing an average of approximately 1 mgd.

In order to accommodate peak demand, potential future development and provide redundancy through 2030 the Village will need to increase the capacity of its existing water supply system. It is recommended that the Village consider adding an additional source(s) of water capable of providing an average of approximately 1.5 mgd to meet these demands and provide system redundancy. Additional storage may also be required.

WATER CONSERVATION

Over the past thirty (30) years, the Village has experienced an increase in annual water consumption. This increase is partially due to growth and partially due to an increase in water consumption on a per capita basis. Based on the 1972 Engineer's Report water consumption was approximately 120 gallons per capita per day (gpcpd) in 1972. Over the last ten years water consumption has increased to approximately 146 gpcpd based on Village pumpage records of 1.64 million gallons per year and an estimated **average service area population of over the last ten years of 11,200**. This is a 22% increase in water consumption on an per capita per day basis. Based on review of data and discussions with Village staff, no significant increase in industrial or commercial water use identified that would result in the increased in water consumption. The increase in water consumption appears to be at least partially attributable to an increase in the amount of water used by residents in the area served by the Village.

Beginning in June 2005 the Village experienced challenges in meeting the demands of its consumers during peak times. Therefore, it is recommended that the Village implement water conservation. The following are some growth items and key issues that are ongoing and are anticipated to continue that can cause water use per capita in a community such as the Village of Barrington to increase:

- Aging water distribution systems that may be leaking.
 - The Village of Barrington has been addressing this cause of increased water demand through systematic replacement of older water mains and water mains with a known history of breakage in its distribution system. In addition, the Village has been conducting leak detection studies on its distribution system approximately every three years to identify and mitigate leakage in its distribution system.
- An increase in the number of larger homes with more green space. These homes typically use more water; especially for outdoor seasonal uses such as watering of lawns.
 - Implementation of water conservation practices will help mitigate the amount of water consumed by outdoor seasonal uses.

The Village has recently amended The Barrington Village Code and enacted a Village ordinance (Ordinance No. 05-3253) to restrict outdoor water use and moderate water waste to meet the essential needs of the Village service area during periods of peak water demand. The ordinance outlines a color-coded system initiated by CONDITION GREEN (least restrictive) which restricts watering outside between 10:00 a.m. and 4:00 p.m. The most elevated level is CONDITION RED, which completely prohibits the use of outside potable water for residential hand washing of motor vehicles, landscaping and lawn watering purposes. Typical recommended demand management activities for systems serving more than 10,000 people include the following (per EPA Guidelines for Conservation Planning):

- ♦ Universal metering - meter all water users to provide a complete accounting of use.

- The Village is currently metering all water users and is improving the level of accuracy of the metering through meter change-outs.
- ◆ Control water losses – leak detection surveys and associated repairs.
- ◆ Costing – institute an inverted water rate to encourage the wise use of water. An inverted rate is a higher volume charge, usually 200 to 500 percent of the current volume charge for water use in excess of 110 to 125 percent of average winter use or average system winter use (whichever is higher).
- ◆ Distribute information and education material on water conservation with water bills, at schools, special Village functions, etc.
- Water-use audits – help customers realize how much water they are really using and where.
- Retrofits – provide plumbing retrofit kits to decrease water use from showers, toilet flushing and faucets.
- Pressure management – lowering system pressure decreases the amount of water people can use in comparable time periods and reduces leakage.
- Xeriscape – plant water efficient trees, shrubs, flowers, and most importantly grass. Tall fescue, zoysia, bermuda and buffalo grasses use much less water and chemicals than rye and blue grass varieties.

Based on published data implementation of the first four bulleted items have resulted in a reduction of 15% to 30% in annual water consumption for communities similar to the Village of Barrington.

Review of pumping data provided by the Village strongly supports the belief that water use for outdoor purposes such as lawn sprinkling and irrigation, etc. have **a significant** impact on peak daily demand in the summer and on total annual water demand in the Village of Barrington.

Burns & McDonnell concurs with the requirements of Chapter 10 “Limitations on Water Use” Village Ordinance No. 05-3253 which promotes conservation, limits outdoor water use and moderates water waste. We do not believe that additional measures such as instituting an inverted water rate, retrofitting existing plumbing, or pressure management are required at this time; however they could be considered in the future if per capita per day rates fail to decline due to non-compliance with Ordinance No. 05-3253. Compliance with Chapter 10 “Limitations on Water Use” by Village area customers could conservatively result in a 15% to 30% reduction in peak water demand during the summer months.

Water Conservation Conditions

Chapter 10 “Limitations on Water Use” of the Barrington Village Code identifies four conditions for water use in the Village. A copy of Chapter 10 is included in Appendix D for reference.

Development of criteria for triggering a change in the water conservation condition is part of this study. The criteria used to support the Village Code could be based on seasonal or statistical data. A program based on a combination of seasonal and statistical data is a common way of determining when a water use condition should be elevated or reduced. Two potential operating scenarios using the conditions identified in Chapter 10 of the Village Code are presented below:

Scenario A – Seasonal (Calendar) Based Water Use Limitation Program

Condition Green – The period of September 16 through May 14.

Condition Yellow – May 15 through September 15 of any calendar year.

Condition Orange – If annual precipitation totals are 15 percent or more below average during the months of May, June, July and August over the prior twelve months.

Condition Red – Pumping levels drop to within five feet of the bowl level in any well in the supply system.

Scenario B – Statistical (Aquifer Level) Based Water Use Limitation Program

Normal Condition – No restrictions.

Condition Green – A drop in static water level of two (2) to four (4) feet in any well when compared to that well's average static water level recorded in January of the same calendar year.

Condition Yellow – A drop of four (4) feet to eight (8) feet in static water level in any well when compared to that well's average static water level recorded in January of the same calendar year.

Condition Orange – A drop of eight (8) feet or more in static water level in any well when compared to that well's average static water level recorded in January of the same calendar year.

Condition Red – Pumping levels drop to within five feet of the bowl level in any well in the supply system.

Both of the above scenarios are viable options for the Village of Barrington. Use of Scenario A (seasonal based) criteria requires less overall management and typically results in a higher level of participation as residents get accustomed to the dates when changes in water use occur. Use of Scenario B (statistical based) can be difficult because Village staff and customers are required to react to real time measurements. It is more difficult to keep the public informed as to what water conservation condition is in effect when utilizing Scenario B. It is also more difficult to enforce restrictions under Scenario B as additional communication is required between Village agencies such as public works and the police department. Additional data on residential and commercial water use should be evaluated before selecting pumping levels at which to enact Condition Red.

* * * * *

DEVELOPMENT OF WATER SUPPLY ALTERNATIVES

One of the objectives of this study is to develop and evaluate local and regional alternatives to increase the capacity of the Village of Barrington's water supply system. This section presents regional and local water supply alternatives for the Village of Barrington.

Regional Alternatives

The regional alternatives include obtaining additional water from Lake Michigan or the Fox River through suppliers that currently serve communities in the Village of Barrington regional area.

In the event that the Village of Barrington proceeds with a regional alternative, it is Burns & McDonnell's recommendation that the Village utilize the regional supply as its primary source of water and maintain its current local wells as emergency back-up in case of a catastrophic failure of the regional supply or regional transmission system. This is common practice in communities that are served by Northwest Suburban Municipal Joint Action Water Agency (NSMJAWA) and the Northwest Water Commission (NWC). With this as a criterion, it is recommended that the regional supply be capable of providing 4.5 mgd of water to the Village.

A flow rate of 4.5 mgd was developed to ensure adequate supply of water to the Village during peak usage and takes into account the future growth that could occur in the Village over the next 25 years. A rate of 4.5 mgd exceeds the current peak daily requirements of the Village, which based on recent groundwater use records have been observed to be between 2.5 and 3 mgd. The average daily water usage rate experienced in 2005 was approximately 1.8 mgd. The average water usage rate since 2001 was approximately 1.68 mgd. With a potential increase in average annual groundwater use to 2.25 mgd through the year 2030 the use of 4.5 mgd as the criteria in assessing the viability of a regional supply is appropriate.

Key criteria that were used in the evaluation of the regional alternatives include:

1. Whether or not the regional supply has adequate available capacity to supply the Village demand of 4.5 mgd.
2. Whether or not treatment of the water supply by the Village is required, and, if so, the estimated cost of the treatment.
3. The length and cost of a new transmission main required to convey water to the Village.
4. Whether or not pressure will need to be boosted to convey water to the Village and the cost of a booster station(s).
5. Whether or not the regional supplier needs to upgrade its distribution system and the associated cost of the upgrades.

6. The recapture fee for connection to the regional supply.
7. Whether or not easement and/or right-of-way acquisition are anticipated.

Regional alternatives developed include the following:

- Alternative A – Interconnection with the City of Elgin;
- Alternative B – Interconnection with Northwest Suburban Municipal Joint Action Water Agency (NSMJAWA);
- Alternative C – Interconnection with the Northwest Water Commission;
- Alternative D – Fox River Intake and Water Treatment Plant; and
- Alternative E – Interconnection with the Village of Hoffman Estates

In addition to the above regional alternatives, the use of local surface waters such as quarries and lakes were considered. These options were not developed into alternatives based on preliminary assessment. Additional discussion of these options is presented later in this section of the report.

A summary of the regional alternatives evaluated is presented in the following paragraphs:

Alternative A – Interconnection with the City of Elgin - An interconnection between the Village and the City of Elgin is a viable alternative based on the capability of the City of Elgin to supply 4.5 million gallons per day. The City of Elgin's primary source of water is the Fox River. The City of Elgin's system is currently operating at approximately 30% of its capacity, but anticipates significant growth in the future. If the Village were to obtain water from the City of Elgin, an interconnection could be made at a 12-inch-diameter water main located approximately 150' from the existing Plote building located east of the Fox River (on the north side of I-90) near Brandt Drive. It is likely that the 12-inch diameter main will need to be increased in size to a minimum of 20-inches in diameter in order for the City of Elgin to deliver 4.5 mgd to the Village. Approximately 58,000 linear feet (11 miles) of transmission main would need to be constructed to convey water from the interconnection point with the City of Elgin to the Village. Since the distribution system at the interconnection location operates at normal distribution system pressure a booster pump station(s) would be required to overcome the significant head loss in conveying water through approximately 11 miles of pipe.

The Village would need to enter into an intergovernmental agreement with the City of Elgin and present plans to the City of Elgin for required review and approval of any proposed improvements at the connection location, as well as provide the City of Elgin with water usage information.

The estimated cost to the Village for the interconnection with the City of Elgin is approximately \$24.7 million as presented in Table 2.

Alternative B – Northwest Suburban Municipal Joint Action Water Agency

(NSMJAWA) Connection - NSMJAWA supplies Lake Michigan water to multiple communities in the western suburbs. Several of these include the Village of Hoffman Estates, the Village of Schaumburg and the Village of Streamwood. A connection between the Village and NSMJAWA is a viable alternative based on the Village's defined needs of 4.5 million gallons per day. A potential connection could be made to the NSMJAWA 60-inch-diameter transmission line on the south side of the intersection of Barrington Road and Interstate 90. Based on preliminary evaluation, approximately 36,000 linear feet (6.8 miles) of new transmission main and a new pressure boosting station will be required to connect to the NSMJAWA at the Barrington Road and Interstate 90 intersection location.

If this option were pursued, then the following action items would be required:

- Approval of an allocation of Lake Michigan water from the Illinois Department of Natural Resources
- An inter-governmental agreement between the NSMJAWA and the Village.
- Water usage information identifying the needs of the Village.
- Plans for presentation to NSMJAWA for their required review and approval of proposed improvements at the interconnection location.

It is likely that NSMJAWA would require the Village to pay some form of a recapture fee for the cost of its existing distribution system.

The estimated cost to the Village for the NSMJAWA connection is approximately \$17.3 million as presented in Table 2. This cost does not include any recapture fee that may be required by NSMJAWA.

Alternative C – Northwest Water Commission (NWC) Connection - The NWC provides Lake Michigan water to several communities in the northwest suburbs. The NWC has a sufficient supply of water to provide the Village with 4.5 mgd; however the NWC stated that a connection to its distribution system would require significant improvements to its distribution system. The NWC stated that it anticipates that “tens of millions of dollars” would be required to upgrade its transmission system to deliver water to the Village of Barrington.

If this option is pursued, a potential location for an interconnection would be at the intersection of Lake Cook Road and Arlington Heights Road. A booster pump station would be required because water in this location is at distribution system pressure. In addition, the Village of Barrington would need approval of an allocation of Lake Michigan water from the IDNR and would have to complete an inter-governmental agreement with the NWC.

In discussions with a Village of Palatine representative, it was reaffirmed that the NWC has sufficient supply to meet the needs of the Village of Barrington; however the existing infrastructure is severely limited. For example, during the summer months, the Village of Palatine's peak demand can reach 16 mgd, but the NWC can only deliver 13 mgd. The result is Palatine must rely on stored water during peak demands to meet its needs.

Due to the significant limitations of the NWC to convey water to the Village of Barrington a detailed preliminary cost estimate was not developed. However, based on cursory review it is anticipated that the cost to the Village to connect to the NWC would be in excess of \$35 million.

Alternative D – Fox River Intake and Water Treatment Plant - Alternative D consists of the Village of Barrington constructing an intake at the Fox River and building a water treatment plant. This alternative would require significant permitting efforts with the Illinois EPA. The Village would be required to have 24-hour operations at the water treatment plant. This requirement is a stipulation of the Illinois EPA when collecting and treating surface water for potable use.

The estimated capital cost for the Village to pursue this alternative is approximately \$30.4 million as presented in Table 2. This cost does not include the cost of additional maintenance personnel or operation costs which would be more per gallon than the other alternatives presented.

Alternative E – Village of Hoffman Estates Interconnection - An interconnection between the Village of Hoffman Estates and the Village of Barrington is a viable alternative based on the Village of Barrington's defined needs of 4.5 million gallons per day. This alternative is similar to Alternative B – NSMJAWA Connection. The Village of Hoffman Estates primary water supply is from NSMJAWA. A possible connection location would be near the AMC movie theater near the intersection of Lakewood Boulevard and Barrington Road.

A potential benefit of an interconnection with the Village of Hoffman Estates instead of NSMJAWA is that the potential NSMJAWA recapture fee would not be required. However, it is not known at this time what the Village of Hoffman Estates connection fee would be, if any.

Based on preliminary evaluation, approximately 35,000 linear feet (6.6 miles) of new transmission main and a new pressure boosting station will be required to connect to Village of Hoffman Estates at this location.

If this option were pursued, then the following would be required:

- Approval of an allocation of Lake Michigan water from the Illinois Department of Natural Resources

- An inter-governmental agreement between both the Village of Barrington and the Village of Hoffman Estates.
- Water usage information from the Village of Barrington.
- Presentation of plans to the Village of Hoffman Estates for their review and approval of the interconnection between the Villages.

The total estimated cost for the Village to pursue this alternative is approximately \$17.2 million as presented in Table 2. This cost does not include a connection fee from the Village of Hoffman Estates.

In addition to the regional alternatives presented above, two regional options were reviewed. These options included an interconnection with the Village of Palatine and the use of regional surface waters such as quarries and lakes for potable water.

Table 2: Evaluation of Regional Alternate Water Supplies

Description	Construction Cost	Land Acquisition	Engineering, Legal Fees, Permitting, & Admin.	Easement/Right of Way Allocation	Total Estimated Cost
Alternate A - Interconnection with the City of Elgin	\$18,533,250	\$250,000	\$5,003,978	\$926,663	\$24,713,890
Alternate B – NSMJAWA Connection	\$12,923,250	\$250,000	\$3,489,278	\$646,163	\$17,308,690
Alternative C – Interconnection with the NWC	ND*	ND*	ND*	ND*	> \$35,000,000
Alternative D – Fox River Intake and Water Treatment Plant	\$19,748,850	\$4,000,000	\$5,602,190	\$987,443	\$30,338,483
Alternate E - Village of Hoffman Estates Interconnection	\$12,804,500	\$250,000	\$3,457,215	\$640,225	\$17,151,940

* ND – Not further developed based on engineering inspection of the cost of the alternative.

Regional Surface Water Options - The use of regional surface waters from lakes and quarries was not pursued based on sustainable water quality and supply. We also believe that security issues are a concern.

Local Alternatives

The local alternatives developed in this study investigate use of groundwater wells to supply additional capacity to the Village. These alternatives include the following:

- Alternative F – Installation of One Pair of New Village Shallow Wells
- Alternative G – Utilization of Existing Fair Haven Wells
- Alternative H – Installation of New Village Deep Wells

Alternative F – Installation of One Pair of New Shallow Village Wells – This alternative consists of installation of one new pair of Village wells in the sand and gravel or Silurian Dolomite aquifers capable of producing approximately 1,042 gallons per minute, thus yielding 1.5 million gallons per day. The new pair of wells would be designed to alternate in operation with each well capable of producing approximately 1.5 mgd. The wells would not be able to operate concurrently for an extended period of time (estimated at several days) without interference.

The additional wells would supply additional capacity required to meet potential future development through 2030 and would provide needed redundancy in the event one of the Village's two existing pairs of wells experiences a reduction in capacity as a result of a mechanical failure. Installation of new wells would require capital costs including the well installation, distribution system improvements, and likely a new groundwater treatment system including storage. If the wells were installed in the sand and gravel aquifer, treatment for iron removal is anticipated. If the wells are installed in the Silurian dolomite aquifer, treatment for sulfur compounds is anticipated.

The preferred location for one pair of these wells would be on existing Village property at a location far enough away from the Village's existing wells to avoid their zone of influence.

The total estimated cost for this installation of new wells is approximately \$4.2 million as presented in Table 3. This cost **does not** include property acquisition.

Alternative G – Utilization of Existing Fair Haven Wells - The utilization of the two existing Fair Haven Wells is a viable alternative to provide an estimated additional one (1) mgd of water to the Village. These wells are located in the Silurian dolomite aquifer. Burns & McDonnell personnel visited the existing Fair Haven well site and determined that if the Village were to pursue this option land acquisition will be required. Approximately one (1) mile of water main from the existing wells to the Village's water distribution system would be required to be installed. It is anticipated that the wells will require significant rehabilitation. It is also anticipated that the existing Fair Haven water distribution system would need to be replaced in order to be in compliance with Village standards. We have assumed that treatment consisting of aeration, at a minimum; will be required for water pumped from these wells. The amount and type of treatment required would need to be confirmed prior to utilizing the Fair Haven

Wells. Land acquisition for this alternative would need to include the property on which the wells are located as well as additional property for treatment and storage as required.

The total estimated cost for this alternative is approximately \$6,812,000 as presented in Table 3.

Alternative H – Installation of New Deep Village Wells – This alternative consists of installation of one pair of new Village wells in the deep bedrock Cambrian-Ordovician sandstone aquifers capable of producing approximately 1,042 gallons per minute, thus yielding 1.5 million gallons per day. The new pair of deep wells would be designed to alternate in operation with each well capable of producing approximately 1.5 mgd. The wells would not be able to operate concurrently for an extended period of time (estimated at several days) without interference.

The additional wells could supply additional capacity to the Village as well as provide redundancy in the event of existing well failures. Installation of new wells would require capital costs including the well installation, distribution system improvements, and likely a new groundwater treatment system including storage.

The preferred location for these wells would be on existing Village property. Since these wells would be located in the deep aquifer, interference with the existing Village wells is not a concern.

Use of the Cambrian-Ordovician sandstone aquifers as a water supply is typically associated with a significantly higher cost than the cost of using the shallow sand and gravel or the Silurian dolomite aquifers available in the Barrington Area. The increased cost is due to the following:

- The installation depth of a well in the deeper sandstone aquifer (800 to 1300 feet in depth) is greater than the depth required to install a well in the sand and gravel or Silurian dolomite aquifers (100 to 300 feet in depth).
- Operation and maintenance costs for wells in the deeper sandstone aquifers are typically higher than the costs to maintain wells in the sand and gravel and Silurian dolomite aquifers due to depth.
- Treatment for naturally occurring barium and radium in the deeper sandstone aquifer, if present, is more expensive than treatment for iron in the sand and gravel aquifer or sulfur containing compounds that may be present in the Silurian dolomite aquifer.

The total estimated cost for this installation of the two new wells in the deep bedrock aquifer is approximately \$8.7 million as presented in Table 3. This cost **does not** include property acquisition.

The potential locations of the alternatives evaluated are presented in Appendix A. Additional breakdown on the development of costs for each alternative, with the exception of Alternative C, are presented in Appendix B.

Table 3: Local Alternatives

Description	Construction Cost	Land Acquisition	Engineering, Legal Fees, Permitting, & Admin.	Easement/ Right of Way Allocation	Total Estimated Cost
Alternative F – Installation of One Pair of New Shallow Village Wells (1.5 mgd)	\$3, 320,000	\$0 *	\$896,000	\$0	\$4,216,000
Alternative G – Utilization of Existing Fair Haven Wells(1 mgd)	\$4,970,000	\$500,000	\$1,341,900	\$0	\$6,811,900
Alternative H – Installation New Village Deep Wells (1.5 mgd)	\$6,870,000	\$0 *	\$1,860,000	\$0	\$8,730,000

* Assumes that the new wells and any necessary treatment and storage facilities can be located on existing Village owned property.

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EVALUATION OF ALTERNATIVES

Lake Michigan Allocation

A key criterion for obtaining Lake Michigan water is acquiring an allocation from the Illinois Department of Natural Resources. Burns & McDonnell contacted Dan Injerd of the Illinois Department of Natural Resources to discuss the possibility of the Village of Barrington receiving a Lake Michigan water allocation. Mr. Injerd stated that a forty year water allocation plan was developed in 1980 and that the application process has not changed since it was developed in 1980. He also stated that allocations are available; however, a community must be able to demonstrate that it meets the criteria for an allocation. Key criteria in obtaining a Lake Michigan water allocation is demonstration that getting Lake Michigan water is the most economical source of supply. The Village of South Barrington was recently denied an allocation because it was classified as a Category III community that did not demonstrate cost-effectiveness of Lake Michigan water.

Based on review of the cost of getting Lake Michigan Water from NSMJAWA or the NWC when compared to acquiring additional water from the local aquifer, it is **not likely** that the Village of Barrington would be granted a Lake Michigan water allocation unless the shallow aquifers in the Village of Barrington area are not sustainable over the long-term. The criteria used by the Illinois Department of Natural Resources in evaluating a community for an allocation is included in Appendix C.

Evaluation of Alternatives

Each of the alternatives developed have the capacity, based on known information, to meet the current and future water demand of the Village. The primary differentiating factor when evaluating the alternatives is cost. The regional alternatives are **significantly** higher in capital cost than the local alternatives. The capital cost for the regional alternatives ranged from approximately \$17.2 million to greater than \$35 million while the capital costs for the local alternatives ranged from approximately \$4.2 million to \$8.7 million

Based on costs, it is recommended that the Village consider a local alternative to provide back-up and additional capacity to its service area. Alternative F – Installation of One Pair of New Village Shallow Wells has the lowest estimated capital cost of \$4.2 million and is recommended. We recommend that the Village consider installing the additional pair of wells by the end of 2007. Installation of these wells should allow for potential future development through 2030 and provided needed redundancy in the event of a mechanical failure at one of the Village's two existing pairs of wells.

Based on the evaluation, Burns & McDonnell met with Village personnel and acquired potential locations for the installation for pairs of new wells on Village owned property. Results of this evaluation are presented in the following section.

Evaluation of Potential Sites for The Installation Of New Wells

The Village of Barrington provided a list of 22 potential well sites which, and after further evaluation by the Village an Burns & McDonnell was pared down to nine sites. In Table 4, Burns & McDonnell has attempted to perform a cursory review demonstrating the minimum requirements necessary to assist the Village in selection.

Siting of additional community well pairs involves a comprehensive understanding of the applicable regulations. The following section outlines the regulatory role in the site selection:

The Illinois Groundwater Protection Act - In 1987, the Illinois General Assembly adopted the Illinois Groundwater Protection Act (IGPA), the most comprehensive Illinois law regarding groundwater quality to date: From the perspective of establishing a groundwater management framework, the IGPA is vital as it defines regulatory measures available to protect water and outlines the administrative, planning, and regulatory roles of state and local agencies and groups. Stipulations of the IGPA will serve as the foundation of any regulatory measures that the Village may decide to impose through local ordinances.

- ***Regulatory Provisions of the IGPA*** - Regulatory mandates of the IGPA include technology controls on well design and construction and setback zones to protect groundwater from land uses that may contaminate water. In addition, the IGPA requires the Illinois Pollution Control Board (IPCB) to establish and codify criteria for groundwater quality. The IPCB compiled and adopted groundwater quality standards in 1991. These standards set allowable concentrations for contaminants in groundwaters used for human consumption and other important purposes. The standards also specify procedures that should be used for monitoring and analyzing groundwater quality. The IEPA enforces groundwater quality standards.
- ***Setback Zones*** - Every community well is required to have a minimum setback zone that restricts certain land uses near the well. Minimum zones provide buffers between the wells and potential primary and secondary sources or routes of contamination. In addition, minimum zones restrict construction of new wells near potential sources and routes of contamination.

Table 4: List of Potential Well Sites

Site Designation	Description	Village owned property	Located over 1000 feet from existing community wells	Meets IGPA Minimum setback zone criteria	Potential based on site geology (High - Low)	Test Well Location
A	Public Works Facility/ WWTP *	Y	Y	N	~	
B	Public Works Nursery (North end of Raymond East) *	Y	Y	N	~	
C	Kilgoblin Wetland (Intersection of UP and EJ & E RR) *	Y	Y	N	~	
D	Library Water Tower (NW Hwy)	Y	Y	Y	High - Sand & Gravel	Primary (depth to water ~ 136 feet)
E	Southgate Stormwater Facilities	Y	Y	Y	Low	
F	Van/Storage Property	Y	N	~	~	
G	Southgate Booster	Y	Y	Y	Low	
H	Southgate Water Tower	Y	Y	Y	Low	
I	1 MG Standpipe Water Tower	Y	Y	Y	High - Broken Limestone	Secondary (depth to water ~225 feet)

* Sites do not meet the minimum setback zone requirements as established by IGPA.

A primary source is defined as a facility that stores large amounts of hazardous materials and any amount of hazardous waste. Secondary sources of contamination include facilities that store smaller amounts of hazardous materials such agricultural chemical facilities, storage sites for de-icing salt, wastewater treatment facilities and petroleum storage tanks (above or underground). Potential routes and pathways for contaminants consist of abandoned wells, drainage wells and sand or gravel mining operations.

Minimum setback zones for community wells are either 200 or 400 feet. If the IEPA designates the well as “vulnerable” due to its depth or nature of the aquifer, the minimum setback zone is **400 feet**. New potential sources or routes of contamination may not be located within a minimum setback zone. Some existing contamination sources and routes are allowed to remain within the setback zone, but they must meet technical criteria regulations including monitoring requirements. Minimum setback zones are mandatory for all public wells and are enforced by the

IEPA. Maximum setback zones around a community well may be as large as 1,000 feet. Maximum zones allow well owners, state, county or municipal governments to regulate land use beyond the required minimum setback zone. Establishing maximum zones is a voluntary process by a county or municipality.

It should be noted that regulations differ depending upon the source and routes of contaminants and whether potential contaminant sources are primary or secondary. In addition, regulations are less stringent in the maximum setback zone than in the minimum setback zone. The IEPA may assist a community in determining the radius of a setback zone by identifying a well's zone of influence.

- **Regulated Recharge Areas** - The IGPA authorizes the establishment of “regulated recharge areas”. A regulated recharge area is an area that requires extra protection to prevent groundwater and public water well contamination. The IEPA or any private party may petition the IPCB to establish a regulated recharge area. Boundaries of these areas can be independent of political borderlines and can be based instead on aquifer boundaries.

The IPCB approves the determination of a regulated recharge area's boundary. The IPCB is directed by law to, “...only promulgate a regulation which establishes the boundary for a regulated recharge area if the Board makes a determination that the boundary of the delineated area is drawn so that natural geological or geographic features contained therein are shown to be highly susceptible to contamination over a predominant portion of the recharge area”. Typically, a detailed hydrologic analysis such as those performed for groundwater protection needs assessments are necessary to provide sufficient evidence to delineate a regulated recharge area.

Potential Well Site D - Library Water Tower: Based on the selection criteria listed in Table 5, two locations have been identified as possible sites for installation of a third pair of wells. Site D identified as the Library Water Tower (along Northeast Hwy) was selected based on site geology and its proximity to the Village's existing iron treatment facility location. Wells at Site D could be installed in either the sand and gravel or Silurian Dolomite aquifers. For purposes of this study, we have assumed that an independent treatment system will be required to treat water from any new wells at Site D.

Potential Well Site I – One (1) MG Standpipe Water Tower Location: A second site was selected at the one (1) MG Standpipe Water Tower location. Well records at this location support the installation of a well in the shallow Silurian Dolomite aquifer. Wells in this location have been installed at a depth of 225 feet. However, the ground elevation at this site is higher than the ground elevation in the surrounding area which may result in the depth of the well being deeper than 225 feet. Treatment for water from these wells is anticipated to consist of aeration.

Currently, the Village's water distribution system conveys water from the north to the south. Installation of the new wells at Site D or an alternate location in the northern portion of the Village would not require modifications to the existing distribution system to convey water from the south to the north. Locating a pair of new wells in the northern portion of the Village is preferable to locating a pair of new wells in the southern portion of the Village.

The other seven locations were excluded based on the selection criteria as shown on Table 4.

The following steps are recommended to further evaluate the potential well sites identified above:

- Distribution System Compatibility/ME – Proposed well locations should be evaluated for infrastructure considerations to make sure they are compatible with the existing Village water distribution system.
- Treatment concerns – The sources of water for potential well locations should be evaluated for treatment requirements.
- Potential routes of environmental contamination should be reviewed.
- Environmental concerns such as whether or not a location is in a floodplain or wetland, etc. should be considered

* * * * *

RECOMMENDATIONS

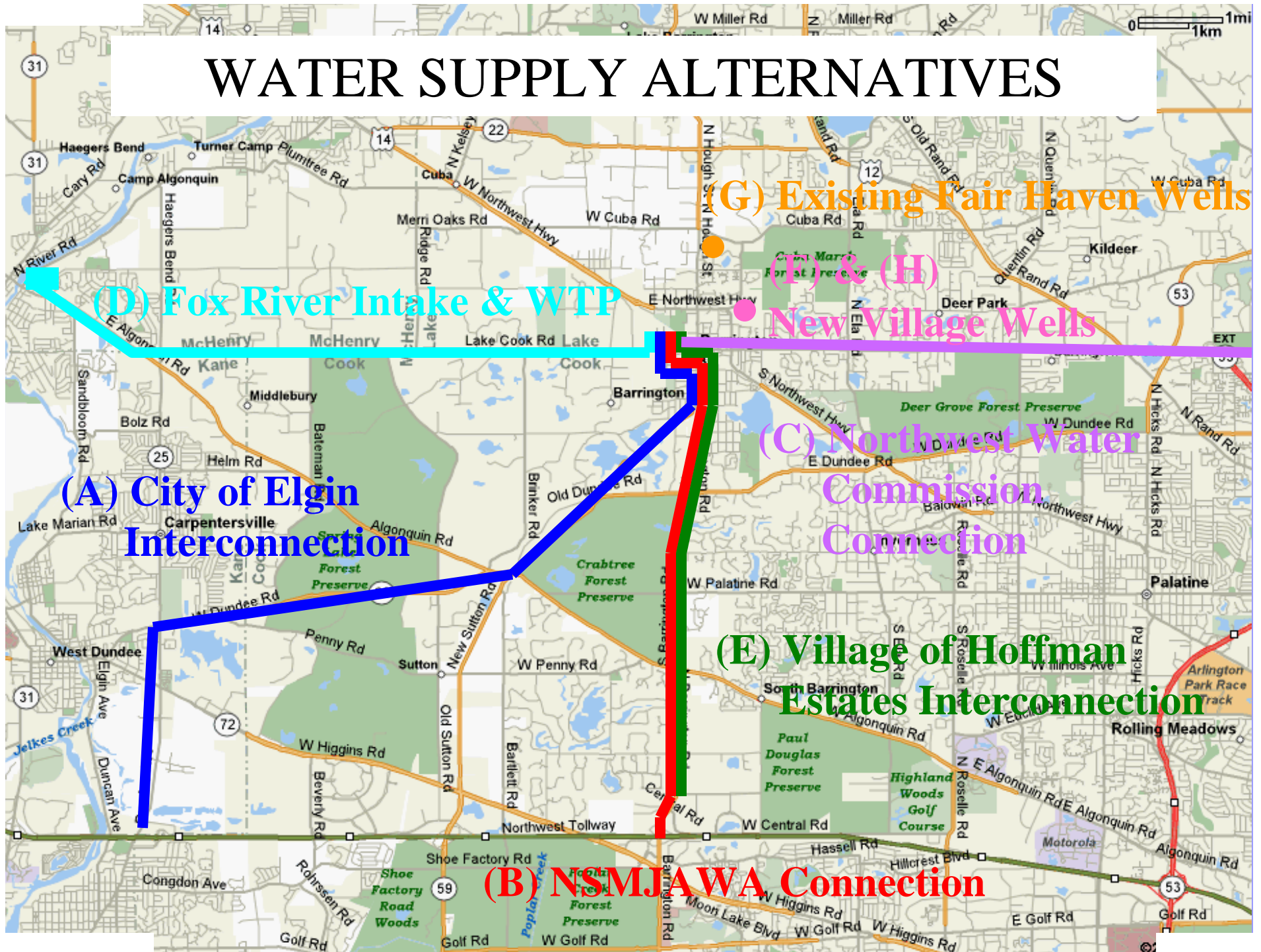
Based on the evaluation of the Village Barrington's existing water supply system and demand, and the evaluation of alternatives developed in this study, it is recommended that the Village of Barrington perform the following:

- Implement the existing water conservation measures identified in Village Ordinance No. 05-3253 and monitor their impact on the peak monthly and annual water demand in the Village.
- Install a new pair of groundwater supply wells capable of supplying 1.5 million gallons per day. **These wells should be installed a minimum of approximately one (1) mile away from the existing well pairs (Well #1 and Well #2; and Well #3 and Well #4) to avoid interference.** These wells would provide needed capacity to meet peak demand over an extended time period (one week or more), needed redundancy in the Village system to serve as a backup in case of operational issues at any of the Village's existing wells, and additional system capacity to meet the potential future development needs of the Village through 2030. The estimated cost for the installation of the new wells and associated treatment and distribution system improvements is approximately \$4.2 million. It is anticipated that these wells could be sited and operational by the end of 2007.
- **Monitor the amount of additional water demand from unlikely, but possible future development in the Village's service area.** Based on the amount of additional demand, the Village should be prepared to install an additional pair of wells capable of supplying up to one (1) mgd per day at a location that will best serve the needs of the growing service area.
- Work closely with the Illinois State Water Survey and BACOG to confirm the long-term sustainability of the sand and gravel and Silurian Dolomite aquifers that currently provide water to the Village of Barrington.

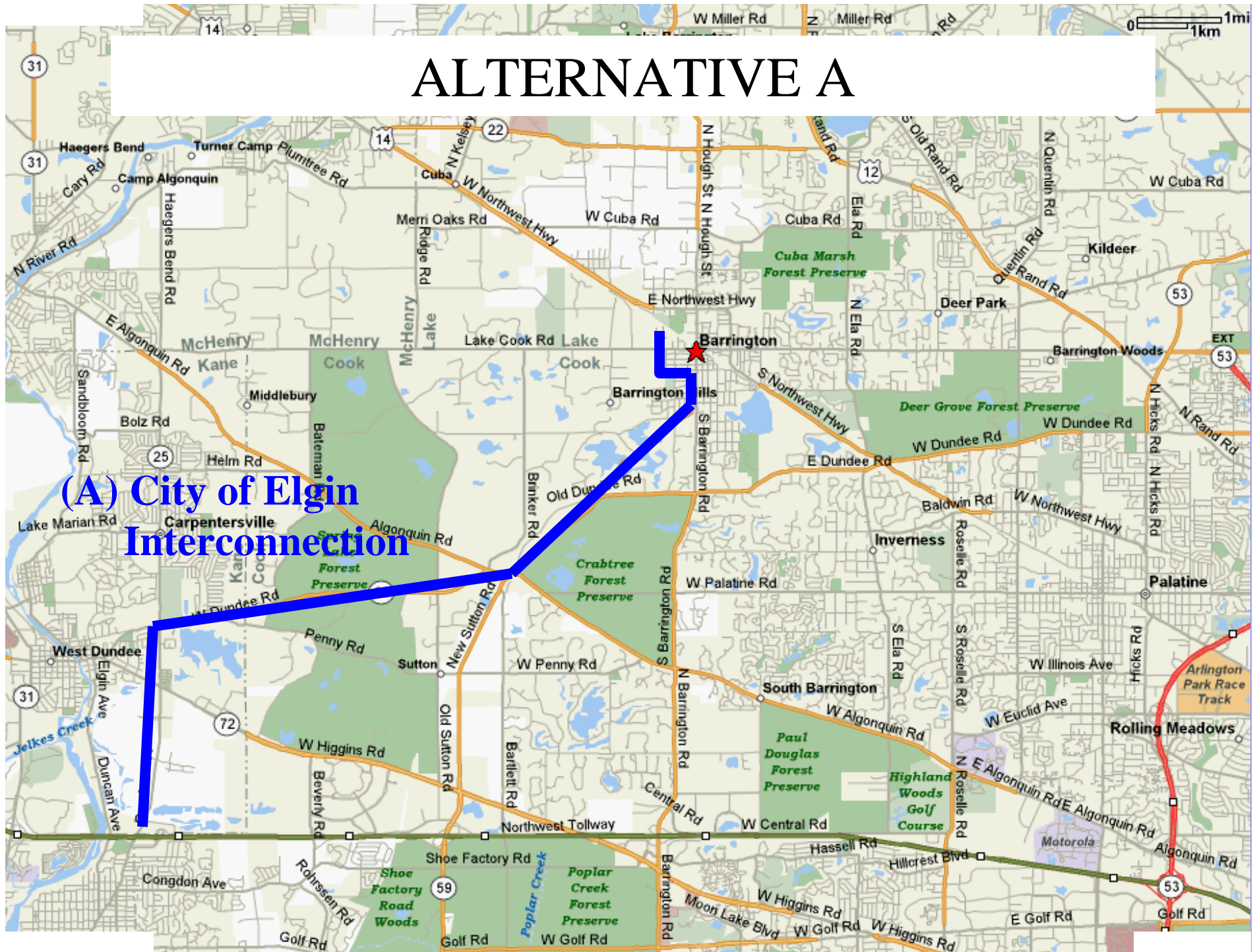
* * * * *

APPENDIX A

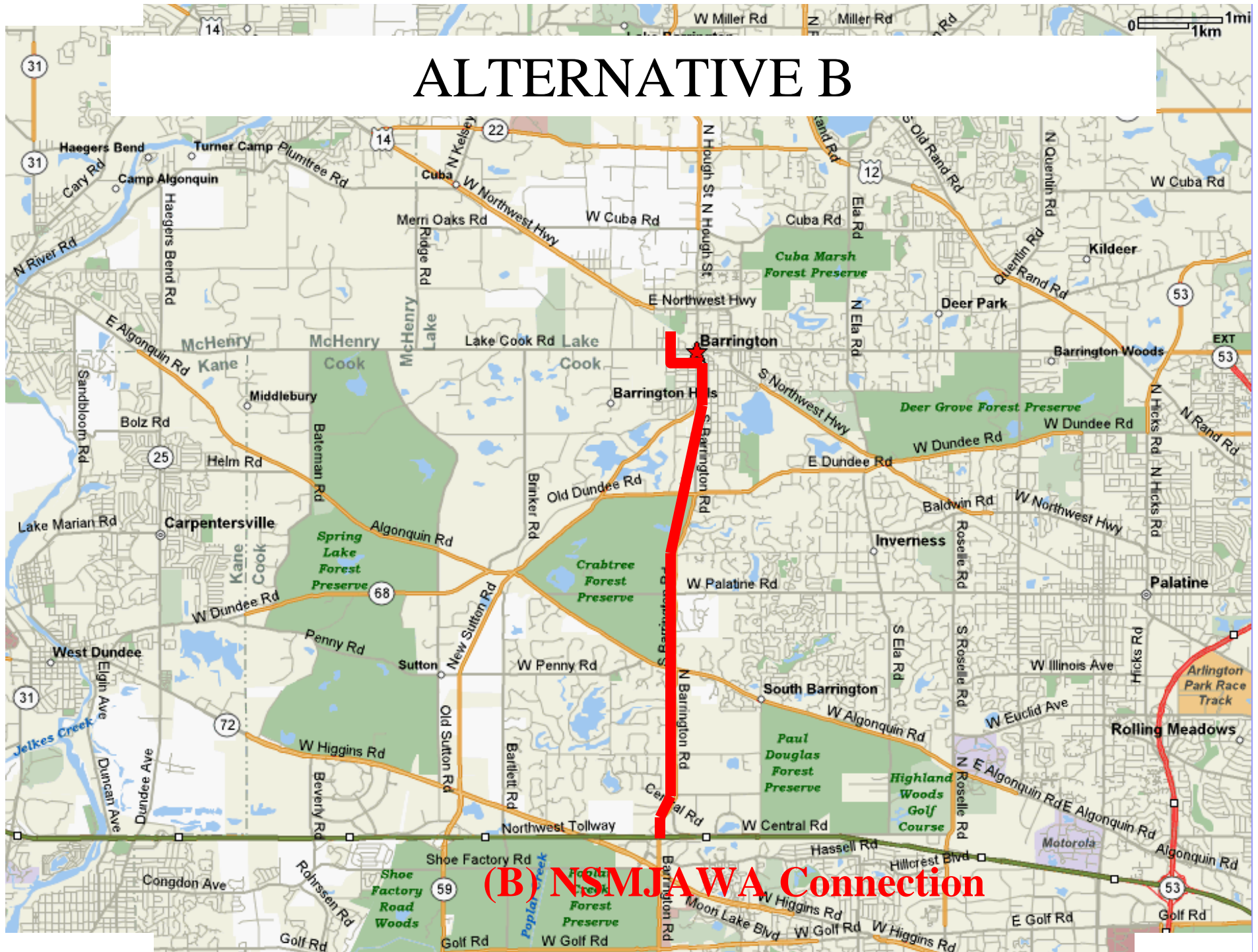
WATER SUPPLY ALTERNATIVES



ALTERNATIVE A

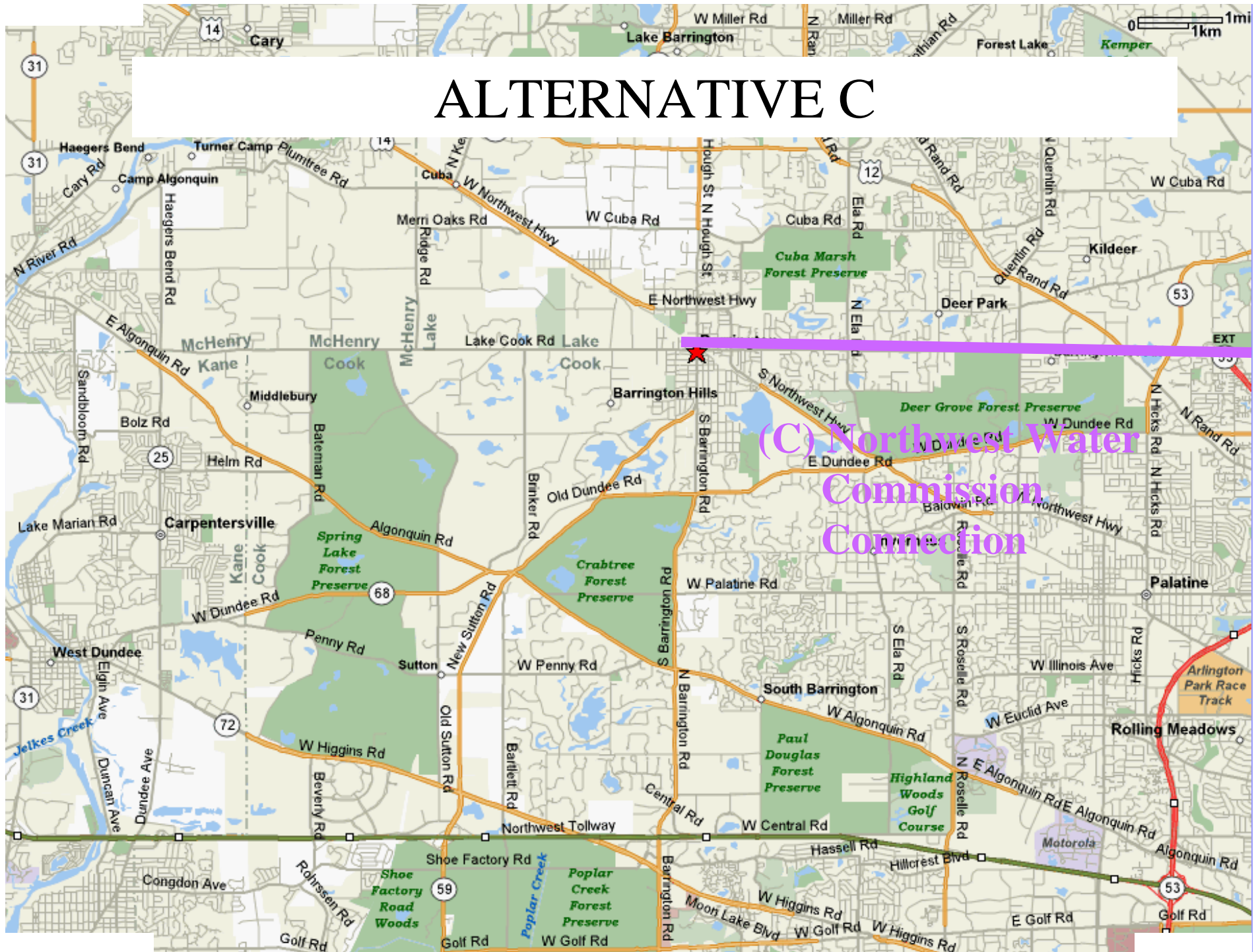


ALTERNATIVE B

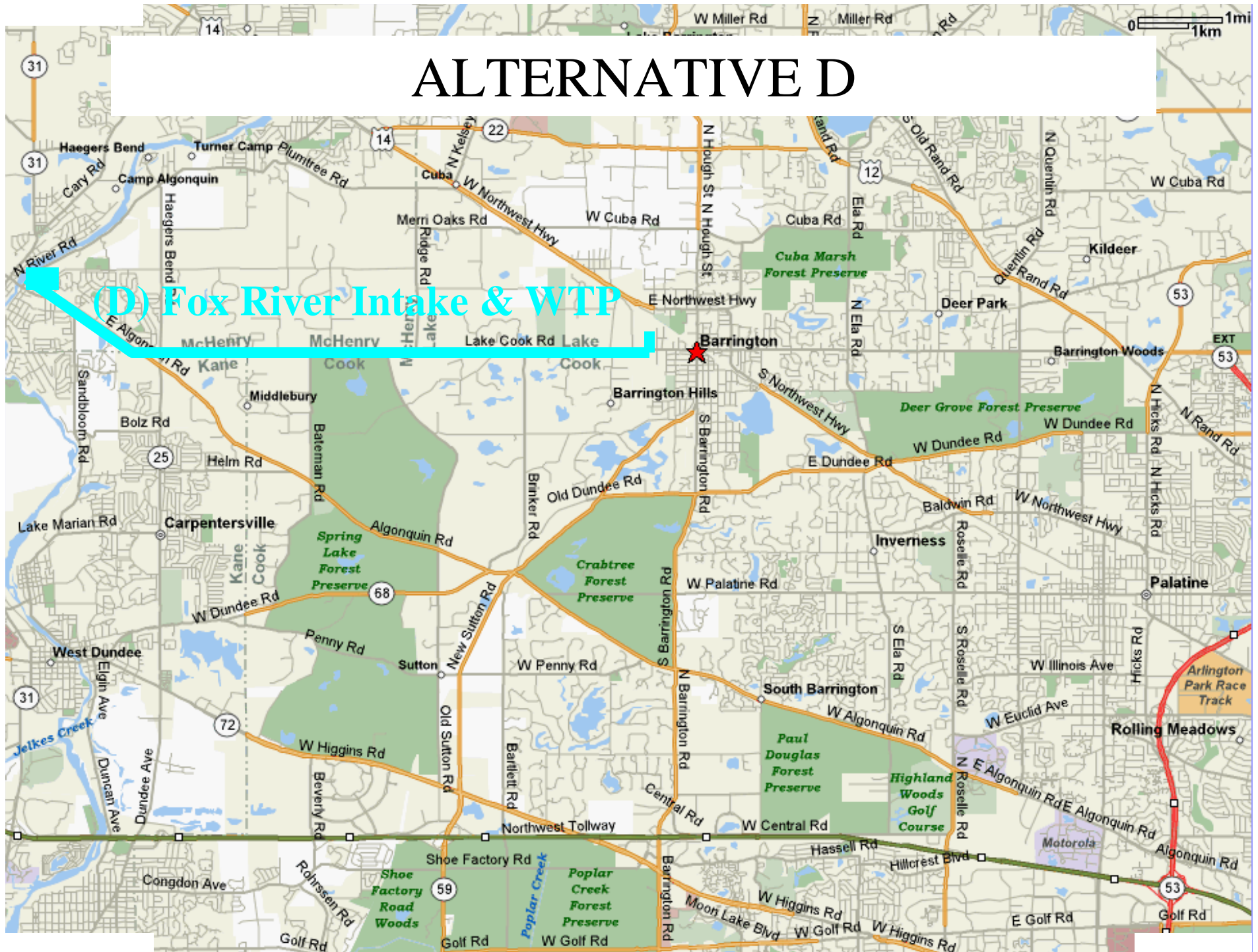


(B) NSMJAWA Connection

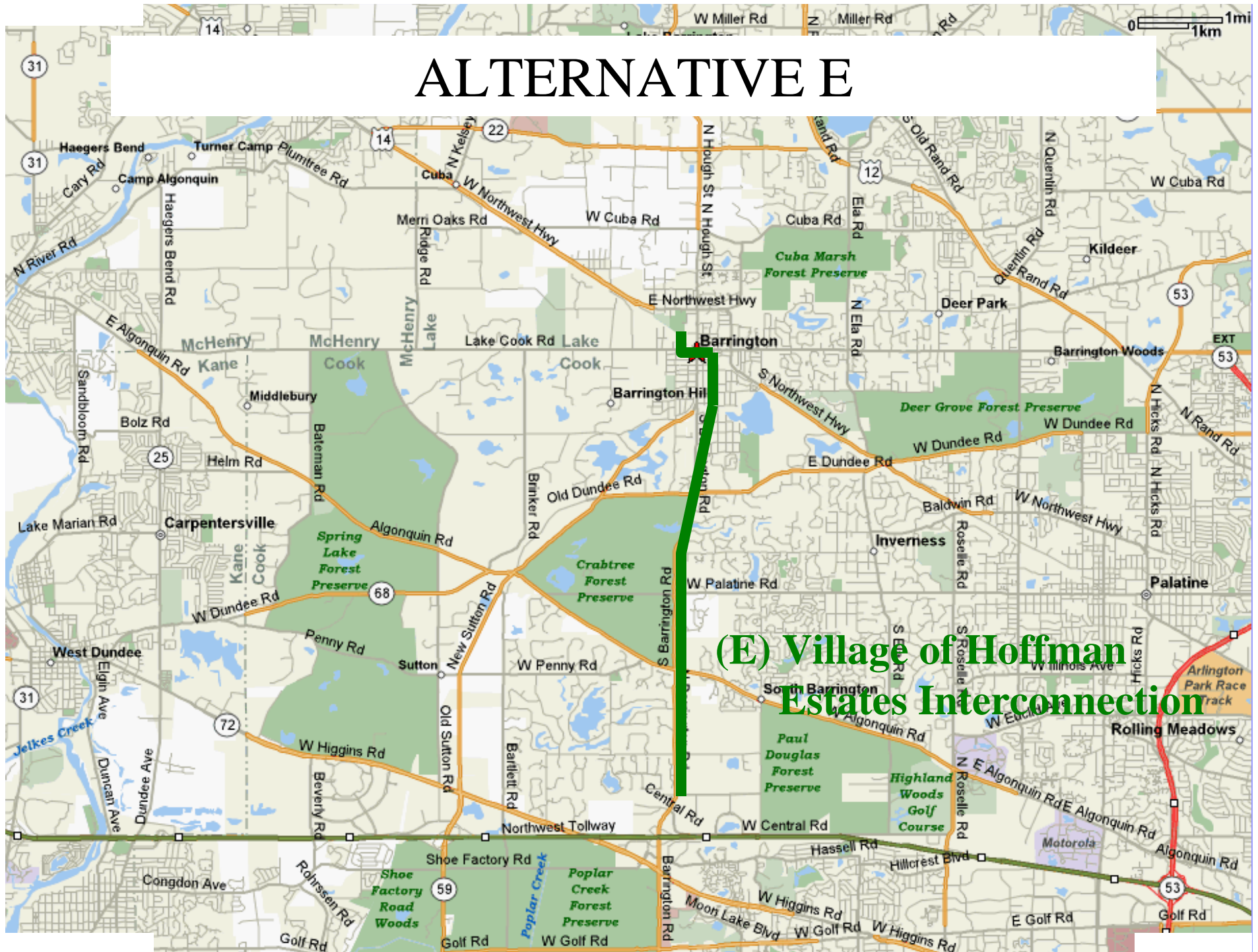
ALTERNATIVE C



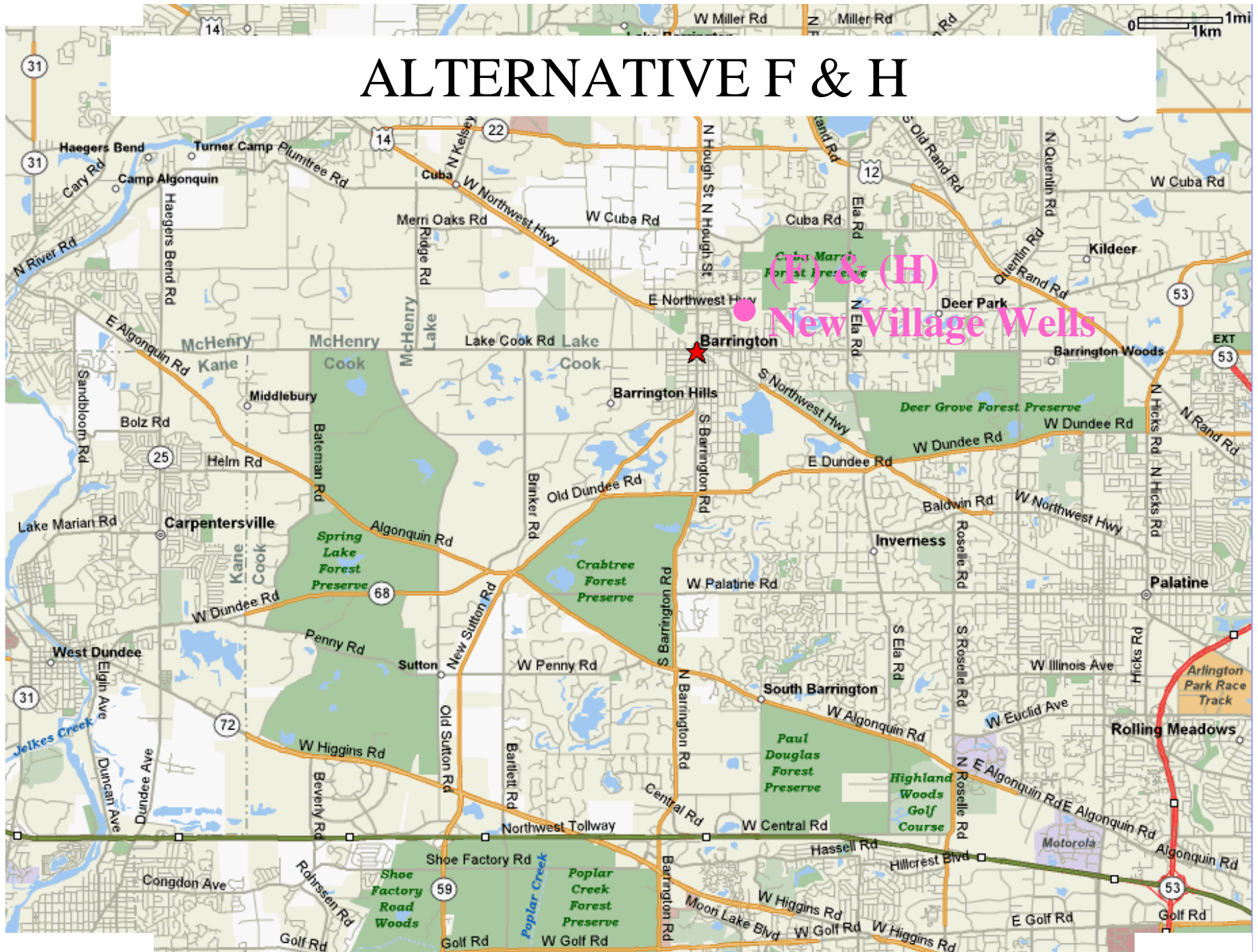
ALTERNATIVE D



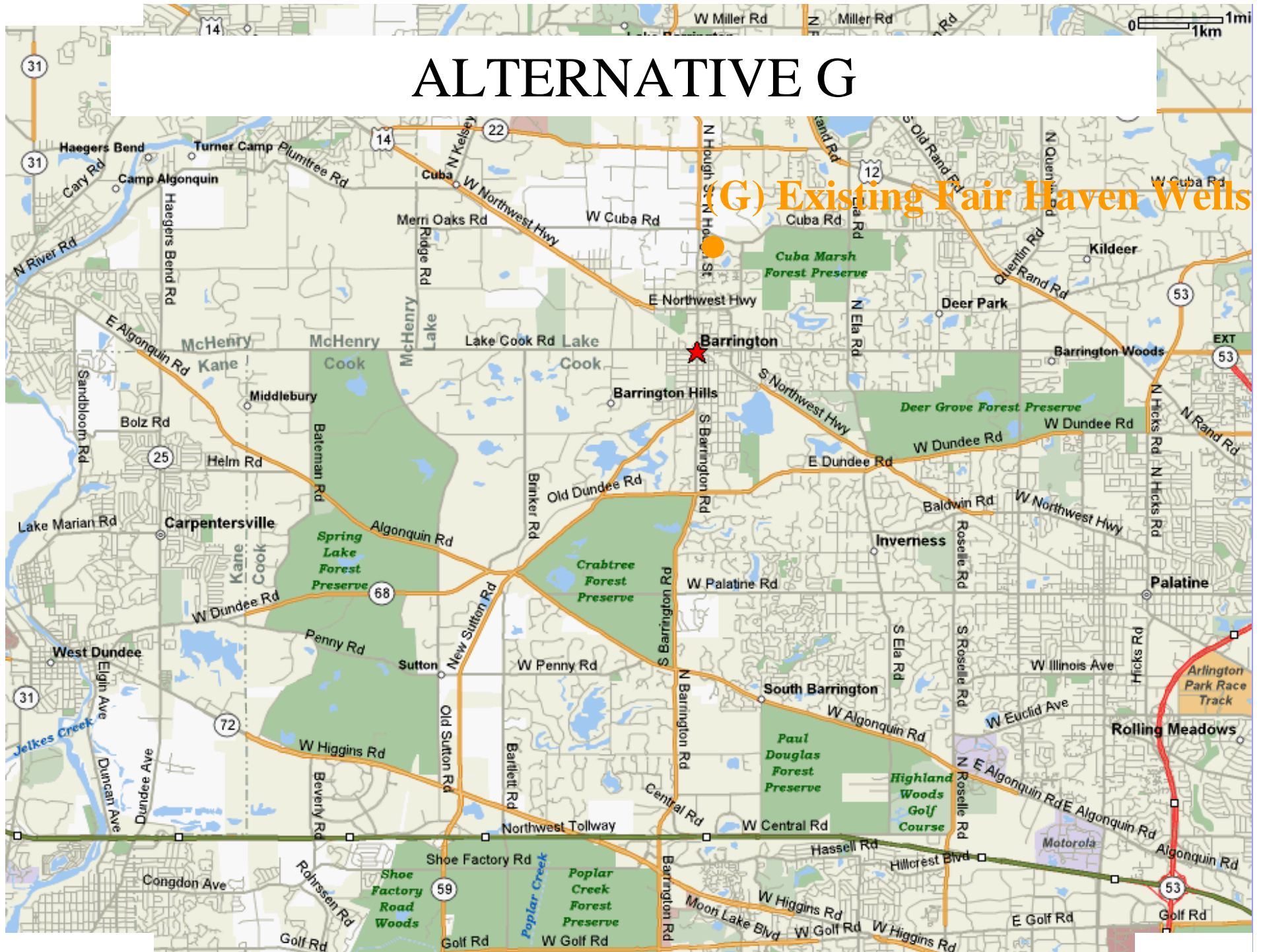
ALTERNATIVE E



ALTERNATIVE F & H



ALTERNATIVE G



APPENDIX B

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternate A - City of Elgin Interconnection
Date: May, 2006

Issue	Response	Size	Quantity	Estimated Cost
Supplier	City of Elgin			
Intergovernmental Agreement Required	Yes			
Approximate Interconnection Location	Intersection of Brandt Drive and Dundee Avenue in Elgin, IL			
Available Capacity	Yes			
Treatment Required	No			
Water Main	Yes	24-inch	58,133 LF	\$14,533,250
Booster Station	Yes	4 MGD	1	\$1,500,000
New Wells	No			
Delivery Station and Transmission Improvements in Village of Barrington	Yes	LS	1	\$2,500,000
Supplier Distribution System Improvements	Yes			UNK
Subtotal Construction				\$18,533,250
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$5,003,978
Booster Station Land Acquisition	Yes			\$250,000
Easement/Right of Way Allocation	Yes			\$926,663
Total Estimated Cost				\$24,713,890

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternate B - NSMJAWA Connection
Date: May, 2006

Item	Response	Size	Quantity	Estimated Cost
Supplier	NSMJAWA			
Intergovernmental Agreement Required	Yes			
Approximate Interconnection Location	Intersection of Barrington Road and Interstate 90 in Hioffman			
Available Capacity	Yes			
Treatment Required	No			
Water Main	Yes	24-inch	35,693 LF	\$8,923,250
Booster Station	Yes	4 MGD	1	\$1,500,000
Delivery Station and Transmission Improvements in Village of Barrington	Yes	LS	1	\$2,500,000
New Wells	No			
Supplier Distribution System Improvements	No			
Subtotal Construction				\$12,923,250
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$3,489,278
Booster Station Land Acquisition	Yes			\$250,000
Easement/Right of Way Allocation	Yes			\$646,163
Total Estimated Cost				\$17,308,690

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternative D - Fox River Intake and Water Treatment Plant
Date: May, 2006

Issue	Response	Size	Quantity	Estimated Cost
Supplier	Village of Barrington			
Intergovernmental Agreement Required	No			
Approximate Interconnection Location	Intersection of East Algonquin Road and the Fox River			
Available Capacity	Yes			
Treatment Required	Yes	5 MGD	1	\$9,000,000
Water Main	Yes	24-inch	41659	\$6,248,850
River Intake	Yes	4 MGD	1	\$2,000,000
New Wells	No			
Delivery Station and Transmission Improvements in Village of Barrington	Yes			\$2,500,000
Subtotal Construction				\$19,748,850
Land Acquisition (5 - 7 Acres, River Intake)	Yes			\$4,000,000
Easement/Right of Way Allocation	Yes			\$987,443
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$5,602,190
Total Estimated Cost				\$30,338,483

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternate E - Village of Hoffman Estates Interconnection
Date: May, 2006

Issue	Response	Size	Quantity	Estimated Cost
Supplier	Village of Hoffman Estates			
Intergovernmental Agreement Required	Yes			
Approximate Interconnection Location	Intersection of Lakewood Boulevard and Barrington Road			
Available Capacity	Yes			
Treatment Required	No			
Water Main	Yes	24-inch	35218	\$8,804,500
Booster Station	Yes	4 MGD	1	\$1,500,000
New Wells	No			
Supplier Distribution System Improvements	Yes			
Delivery Station and Transmission Improvements in Village of Barrington	Yes	LS	1	\$2,500,000
Subtotal Construction				\$12,804,500
Booster Station Land Acquisition	Yes			\$250,000
Easement/Right of Way Allocation	Yes			\$640,225
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$3,457,215
Total Estimated Cost				\$17,151,940

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternative F - Installation of One Pair of New Shallow Village Wells
Date: May, 2006

Issue	Response	Size	Quantity	Estimated Cost
Supplier	Village of Barrington			
Intergovernmental Agreement Required	No			
Approximate Interconnection Location	Not Required			
Available Capacity	Yes			
Treatment Required	Yes	1.5 MGD	1	\$2,250,000
Water Main	Yes	12-inch		\$500,000
Booster Station	No			
New Wells	Yes		2	\$570,000
Supplier Distribution System Improvements	No			
Subtotal Construction				\$3,320,000
Easement/Right of Way Allocation*	Yes			\$0
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$896,000
Total Estimated Cost				\$4,216,000

*Assume Village-owned property.

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternative G - Utilization of Existing Fair Haven Wells (1 mgd)
Date: May, 2006

Item	Response	Size	Quantity	Estimated Cost
Supplier	Village of Barrington			
Intergovernmental Agreement Required	No			
Approximate Interconnection Location	Fair Haven Subdivision			
Available Capacity	Yes			
Treatment Required	Yes	1 MGD	1	\$1,500,000
Water Main	Yes	12-inch	5280	\$1,320,000
Booster Station	No			
New Wells	No			
Supplier Distribution System Improvements	Yes			\$1,000,000
Fair Haven System Installation	Yes			\$1,000,000
Well Maintenance/Check-out/Install Pump and Moto	Yes			150000
Subtotal Construction				\$4,970,000
Easement/Right of Way Allocation	Yes			\$0
Treatment Plant Land Acquisition (1 acre)	Yes			\$500,000
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$1,341,900
Total Estimated Cost				\$6,811,900

Village of Barrington Water Supply Study
Evaluation of Alternate Water Supplies
Alternative H - Installation of New Village Deep Wells (2 mgd)
Date: May, 2006

Item	Response	Size	Quantity	Estimated Cost
Supplier	Village of Barrington			
Intergovernmental Agreement Required	No			
Approximate Interconnection Location	Not Required			
Available Capacity	Yes			
Treatment Required	Yes	1.5 MGD	2	\$3,370,000
Water Main	Yes	12-inch	5280	\$500,000
Booster Station	No			
New Wells	Yes			\$3,000,000
Subtotal Construction				\$6,870,000
Easement/Right of Way Allocation	Yes			\$0
Treatment Plant Land Acquisition (1 acre)	Yes			\$0
Engineering, Legal Fees, Permitting, & Admin.	Yes			\$1,860,000
Total Estimated Cost				\$8,730,000

APPENDIX C


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 Rod R. Blagojevich, Governor

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TITLE 17: CONSERVATION

CHAPTER I: DEPARTMENT OF NATURAL RESOURCES

SUBCHAPTER h: WATER RESOURCES

PART 3730

ALLOCATION OF WATER FROM LAKE MICHIGAN

SUBPART A: GENERAL RULES

Section

[3730.101 Scope](#)
[3730.102 Definitions](#)
[3730.103 Filing](#)
[3730.104 Form of Documents](#)
[3730.105 Service of Documents and Proof of Service](#)
[3730.106 Computation of Time](#)
[3730.107 Appearances and Representation](#)

Water Resource Management

[Office of Water Resources](#)
[Water Resource Management](#)
[Permit Programs](#)
[Preliminary Design Reports for Dams](#)
[Lake Michigan Water Allocation Program](#)
[Application Form](#)
[General Permits](#)
[Regional Permits](#)
[Statewide Permits](#)
[F.A.Q.'s](#)
[Contact Information](#)



[3730.108 Designation and Representation](#)

[3730.109 Public Information](#)

[3730.110 Severability](#)

SUBPART B: HEARING

Section

[3730.201 Applicability](#)

[3730.202 Authorization of Hearings](#)

[3730.203 Parties](#)

[3730.204 Allocation Applications and Petitions for Modification](#)

[3730.205 Complaint](#)

[3730.206 Notice of Hearing](#)

[3730.207 Prehearing Conferences](#)

[3730.208 Discovery](#)

[3730.209 Admissions](#)

[3730.210 Authority of Hearing Officer](#)

[3730.211 Hearing Procedure](#)

[3730.212 Subpoenas](#)

[3730.213 Official Record](#)

[3730.214 Order of Hearing Officer or Director](#)

[3730.215 Hearing Officer's Proposed Order](#)

SUBPART C: ALLOCATION RULES

Section

[3730.301 Allocation Permits](#)

[3730.302 Application](#)

[3730.303 Classification of Water Users](#)

[3730.304 Water Needs Criteria](#)

[3730.305 Emergencies](#)

[3730.306 Transfer of Water Use Rights](#)

[3730.307 Conservation Practices and Other Permit Conditions](#)

[3730.308 Duration of Permit and Renewals](#)

[3730.309 Reporting Requirements](#)

[3730.310 Petitions for Modification](#)

SUBPART D: ADMINISTRATIVE REVIEW

Section

[3730.401 Administrative Review](#)

[3730.402 Modification of Order and Decision of Department](#)

SUBPART E: PENALTIES

Section

3730.501 Penalties

AUTHORITY: Implementing and authorized by the Level of Lake Michigan Act [615 ILCS 50].

SOURCE: Adopted at 4 Ill. Reg. 38, p. 223, effective September 9, 1980; amended at 5 Ill. Reg. 9158, effective September 1, 1981; codified at 7 Ill. Reg. 9683; amended at 9 Ill. Reg. 386, effective January 1, 1985; amended at 14 Ill. Reg. 1484, effective January 3, 1990; recodified from 92 Ill. Adm. Code 730, Department of Transportation, to Department of Natural Resources, at 22 Ill. Reg. 7362.

SUBPART A: GENERAL RULES

Section 3730.101 Scope

This Part governs the practices and procedures of the Director and his delegated representatives, and all allocation and enforcement proceedings conducted by them pursuant to the Level of Lake Michigan Act [615 ILCS 50].

Section 3730.102 Definitions

As used in this Part except where the context indicates otherwise, the following terms shall have the meanings specified:

"Act" means the Level of Lake Michigan Act [615 ILCS 50].

"Annual accounting period" shall be October 1 of each calendar year through the last day in September in the succeeding calendar year;

"Department" means the Illinois Department of Natural Resources;

"Director" means the Director of the Illinois Department of Natural Resources or his duly delegated representatives;

"Emergency allocation" means a temporary allocation of Lake Michigan water in accordance with Section 3730.305;

"Emergency and standby use" means water pumped to maintain an adequate water supply in the event of a partial or total failure of the primary water supply source of a permittee;

"Gross annual pumpage" means the total amount of water delivered to a user's system;

"Hearing Officer" means a person duly designated as the hearing officer by the Director;

"Hydrant uses" means, but is not limited to, all water obtained from hydrants for uses such as fire fighting and training, water main flushing, sewer flushing, street cleaning, and unmetered public and private construction;

"Net annual pumpage" means the total amount of water delivered to a user's system not including wholesale water delivered to other water systems;

"New users" refers to any regional organization, municipality, political subdivision, agency, instrumentality, organization, association, or individual that did not have an allocation of Lake Michigan water from the Department on July 1, 1980;

"Party" means an entity:

which has made application to the Department for an allocation of the Lake Michigan diversion pursuant to the Act, or

which has been made a party by the Hearing Officer pursuant to Section 3730.203 (c);

"Permittee" means any regional organization, municipality, political subdivision, agency, instrumentality, organization, association, or individual that has an allocation permit for water from the Lake Michigan diversion;

"Unaccounted-for flow" means that amount of water supplied to a system (including the components of transmission, distribution, storage, and pumping) which is lost from the system prior to delivery to the end user, but not including unavoidable leakage. "Unaccounted-for flow" shall include water not accounted for due to underregistration of meters and water lost due to main breaks. "Unaccounted-for

flow" shall be calculated by taking the net annual pumpage of the system and subtracting from that figure the amount of water used for residential, commercial, industrial, municipal, hydrant, other identified uses, and unavoidable leakage. The remainder shall be the "unaccounted-for flow." In determining the amount of water used for uses that are unmetered, estimates shall be based on acceptable engineering practices at the time of each unmetered use;

"Unavoidable leakage" means that amount of water lost from a well maintained water system. In determining "unavoidable leakage," consideration shall be given to the age, size and type of pipe and joints, ground conditions surrounding the pipes, the number of service connections, the number of valves and hydrants, and system pressures. The maximum allowable "unavoidable leakage" shall be determined as follows:

For cast iron pipe with lead joints

Age of system Maximum unavoidable leakage

greater than 60 years 3000 gal/day/mile of main

40 to 60 years 2500 gal/day/mile of main

20 to 40 years 2000 gal/day/mile of main

less than 20 years 1500 gal/day/mile of main

For all other types of pipe and joints

Age of system Maximum unavoidable leakage

greater than 60 years 2500 gal/day/mile of main

40 to 60 years 2000 gal/day/mile of main

20 to 40 years 1500 gal/day/mile of main

less than 20 years 1000 gal/day/mile of main

(Source: Amended at 9 Ill. Reg. 386, effective January 1, 1985)

Section 3730.103 Filing

Documents and requests permitted or required to be filed with the Hearing Officer shall be addressed to and mailed to or filed with the Hearing Officer at the following address:

Hearing Officer

Lake Michigan Allocation Proceedings

Illinois Department of Natural Resources

524 S. Second Street

Springfield, Illinois 62701-1787

or with such other person as the Director may designate from time to time.

Section 3730.104 Form of Documents

- a) Documents shall clearly show the file or docket number and title of the proceeding in connection with which they are filed, and shall be clearly designated to indicate the nature of the relief sought, inter alia, "application for allocation permit," "complaint," "petition for modification," "petition for emergency allocation," or "motion."
- b) Except as otherwise provided, four copies of all documents including application, complaints, motions, petitions, and petitions for review shall be filed with the Hearing Officer. Only two copies of any discovery motion, interrogatories, answers to interrogatories, or subpoena filed with or by the Hearing Officer need to be filed with the Hearing Officer.
- c) Documents shall be typewritten or reproduced from typewritten copy on unglazed white paper of greater than 12 pound weight and measuring 8-1/2" x 11". Reproductions may be made by carbon or electrostatic copying machine or any other process that produces legible black-on-white copies. All documents shall be

fastened on the left side or in the upper left hand corner. The left margin of each page shall be at least 1-1/2 inches and the right margin at least one inch.

- d) One copy of each document will be signed by the applicant or party or by his authorized representative or attorney.
- e) Documents shall contain the name, address and phone number of the applicant or party filing or his authorized representative or attorney.

(Source: Amended at 9 Ill. Reg. 386, effective January 1, 1985)

Section 3730.105 Service of Documents and Proof of Service

- a) Where the Hearing Officer or any person is required by statute or by the provisions of these rules to serve any document upon any person, service shall (in the absence of specific provisions in these rules to the contrary) be made in accordance with the provisions of this section.
- b) Where any person is required to serve any document filed with the Hearing Officer, service shall be made by that person or by his representative on or before the day on which the document is filed.
- c) Documents may be served upon a party, his attorney, or other duly constituted agent by delivering a copy or by mailing a copy to the last known address. When a party is represented by an attorney of record in any proceeding, service shall be made upon such attorney.
- d) Delivery of a copy pursuant to this section means handing it to the party, his attorney, or other duly constituted agent or other person in charge of the office of the person being served; or, if there is no one in charge of such office, leaving it in a conspicuous place therein; or, if such office is closed or the person to be served has no office, leaving it at his dwelling house or usual place of abode with some person of suitable age and discretion then residing therein.
- e) Service by mail is complete upon mailing.
- f) Proof of service, as provided in this Section, shall be filed before action is taken. The proof of service shall show the time and manner of service, and may be by

written acknowledgment of service, by certificate of the person effecting the service, or by other proof as satisfactory to the Hearing Officer. Failure to make proof of service will not affect the validity of the service. The Hearing Officer may allow the proof to be amended or supplied at any time before action is taken unless to do so would result in material prejudice to a party.

Section 3730.106 Computation of Time

- a) Computation of any period of time prescribed by these rules or the Act shall begin with the first business day following the day on which the act, event or development initiating such period of time occurs, and shall run until the end of the last day, or the next following business day if the last day is a Saturday, Sunday or legal holiday. Where the period of time is five days or less, Saturdays, Sundays and legal holidays shall be excluded in the computation of time.
- b) Notice requirements shall be construed to mean notice received, but proof that notice was dispatched by means reasonably calculated to be received by the prescribed date shall be prima facie proof that notice was timely received.

Section 3730.107 Appearances and Representation

- a) Any person entitled to participate in proceedings may appear as follows:
 - 1) A natural person may appear in his own behalf or by an attorney at law licensed and registered to practice in the State of Illinois.
 - 2) A business, non-profit, or government organization may appear by any bonafide officer, employee, or representative, or may be represented by an attorney licensed and registered to practice in the State of Illinois, or both.
- b) Attorneys not licensed and registered to practice in the State of Illinois may appear on motion.
- c) An attorney appearing in a representative capacity shall file a written notice of appearance together with proof of service on all parties or their respective attorneys.

Section 3730.108 Designation and Representation

- a) A party entitled to participate in the hearing proceeding may designate another entity to represent its interests by filing with the Department a written application accompanied by a Resolution from the governing board of the designating party and a written Acceptance from the entity appearing in a representative capacity. The Designation of Representation and Acceptance of such designation shall be made on forms prescribed by the Department and executed by duly authorized officials of the parties. The designating party may withdraw the designation at any time upon its own motion with or without the consent of the previous designee.
- b) The designated representative will be responsible to file all documents, complete all applications, answer all inquiries, present all testimony, and represent all other interest of the designating party for the purpose of applying for and obtaining a water withdrawal permit for water from Lake Michigan.
- c) After receipt of the aforementioned documents, all correspondence will be directed to the designated representative only and the designating party is irrevocably bound by its action in these matters until such time as the designation is withdrawn and receipt of such withdrawal is acknowledged by the Department.

Section 3730.109 Public Information

- a) The Department shall maintain files containing all information submitted to or produced by the Department or Hearing Officers relating to matters within the Department's jurisdiction, except that internal communications of the Department shall be filed only at the request of the Director or his designated representatives. Without limiting the generality of the foregoing, the files shall include, among other things: pleadings, motions, notices, minutes, transcripts, exhibits, orders and opinions; proposed and adopted regulations; communications to or from the Department; newsletters and other releases; business records; and informal complaints received.
- b) All such files shall be open to reasonable public inspection and copying, at the expense of the interested party.
- c) The Department shall maintain a comprehensive index of all files open to public inspection.
- d) The Department may in its discretion disseminate from time to time newsletters, digests of minutes and other releases regarding any matter before the Department.

Section 3730.110 Severability

If any rules, sentence, clause, subsection, phrase or requirement of these rules is for any reason held to be unconstitutional or violative of law, by a court of competent jurisdiction, such decision shall not affect or impair the validity of the remaining portions of these rules.

SUBPART B: HEARING**Section 3730.201 Applicability**

The rules of this part shall apply to all hearings concerning allocation of Lake Michigan water other than rulemaking.

Section 3730.202 Authorization of Hearings

- a) Allocation Hearing: Except in the case of an emergency allocation, the Department shall hold allocation hearing(s) as authorized by the Act within 90 days of submission to the Department of an application for allocation or on the motion of the Department, the purpose of which shall be publicly stated to be contemplation of allocations of Lake Michigan water. The burden of proof in an allocation proceeding will lie with each applicant for an allocation.
- b) Enforcement Proceeding: The Department may hold hearing(s) as authorized by the Act within 90 days of submission to the Department by any entity of a complaint for misuse of allocation, or on the motion of the Department for the purpose of gathering information with reference to abuse or misuse of any allocation and of entering an order presenting findings and directing a course of action, including changes in allocations previously made. Hearings will be held on all complaints which comply with Section 3730.205 (a), are not plainly devoid of merit or frivolous, and do not deal with a subject on which a hearing has been held within the preceding six months.
- c) Petitions for Modification: The Department may hold hearing(s) on a petition for modification of an allocation permit. The burden of proof in a modification proceeding will lie with the petitioner/applicant. Hearings will be held on all petitions which comply with Section 3730.310 (a).
- d) Petitions for Emergency Allocation: The Department shall within 60 days of

issuing and entering an order for an emergency allocation give notice and conduct a hearing regarding such emergency allocation.

e) Designation of Hearing Officer: If the Department authorizes a hearing under any of the above sections, the Director shall designate a Hearing Officer to preside over such hearing.

(Source: Amended at 9 Ill. Reg. 386, effective January 1, 1985)

Section 3730.203 Parties

a) The party seeking an allocation permit, an emergency allocation, or the modification of an allocation permit shall be designated as the petitioner. Any party initiating an enforcement proceeding shall be designated as the complainant. Any party who seeks to be heard and whose interests are adverse to the petitioner's or the complainant's shall be designated as the respondent.

b) Incorrect designation of a party is not a ground for dismissal but the name of a party may be corrected at any time.

c) If a complete determination of an controversy cannot be had without the presence of other parties, the Hearing Officer may direct them to be made parties. The Hearing Officer may allow the intervention of other persons of entities with an interest in the matter on any side of the controversy or in aid of the Department.

Section 3730.204 Allocation Applications and Petitions for Modification

Four copies of application for allocations, petition for emergency

allocation, and petition for modification shall be filed with the

Department and shall contain:

a) In the case of an Application for Allocation, all information required under Section 3730.302.

b) In the case of a Petition for Emergency Allocation, all information required under Section 3730.305.

- c) In the case of a Petition for Modification, all information required under Section 3730.310 including reference to any change in circumstances or any information previously submitted pursuant to Section 3730.302 and any claimed errors in interpretation of the Act or the rules.

Section 3730.205 Complaint

- a) Pursuant to Section 3730.202 (b), a Complaint shall contain the following:
- 1) a reference to the provision of the Act or the rules of which the respondent(s) is alleged to be in violation; and
 - 2) the dates, location, events, nature, extent and duration of abuses or misuses alleged to constitute violations of the Act or the rules complained of to an extent sufficient to advise respondent(s) of the full extent and nature of matters complained of adequate to reasonably allow preparation of a defense.
- b) Unless respondent files an answer within 20 days after receipt of the complaint, all material allegations shall be taken as denied. All motions preliminary to a hearing shall be presented to the Hearing Officer at least 5 days prior to the date of hearing, or on such other date as the Hearing Officer or these rules shall designate.

Section 3730.206 Notice of Hearing

- a) In cases in which a hearing is held pursuant to Section 3730.202 (a), (c) or (d), the commencement of the hearing shall be within 90 days after the date on which the application for allocation or petition for modification of allocation was received by the Department unless otherwise ordered by the Hearing Officer, or within 60 days after an order for an emergency allocation was entered by the Department. The Department shall give notice of hearing in these cases as follows:

- 1) to all permittees; petitioners; the Counties of Cook, DuPage, Kane, Lake, Will, and McHenry; the City of Chicago; the Metropolitan Water Reclamation District; the Illinois Environmental Protection Agency; and the Northeastern Illinois Planning Commission and
- 2) by publication not less than twice in newspapers of general circulation in the immediate and remote area(s) which may be affected by diversions of Lake Michigan waters, such publications to be no longer than one week apart, and the

hearing to be held within 10 days following date of last publication;

b) In cases in which a hearing is held pursuant to Section 3730.202(b), complainant(s) and respondent(s) shall receive notice by certified mail of the time and place of the hearing no less than 20 days before the hearing is held. In addition, complainant(s) must provide proof of service of the complaint on each respondent showing that service was completed in compliance with Section 3730.105 no less than 20 days before the hearing is held.

c) The Hearing Officer shall make available to any person copies of applications, petitions, or complaints at the time the hearing date is announced.

(Source: Amended at 9 Ill. Reg. 386, effective January 1, 1985)

Section 3730.207 Prehearing Conferences

a) In any proceeding the Hearing Officer may direct parties or their attorneys to appear, upon 10 or more days written notice, at a specified time and place for a conference, prior to or during the course of hearing for the purpose of formulating issues and considering:

- 1) The simplification of issues of fact and law;
- 2) the necessity or desirability of amending documents for the purpose of clarification, amplification, or limitation;
- 3) the possibility of making admissions of certain averments of fact or stipulations concerning the use of matters of public record to avoid unnecessary introduction of proof;
- 4) the limitation of the number of witnesses, including experts;
- 5) the propriety of prior mutual exchange between or among parties of prepared testimony and exhibits; and
- 6) such other matters as may aid in the simplification of the evidence and disposition of the proceeding.

- b) Action taken at the conference shall be recorded in an appropriate ruling unless the parties enter into written stipulations as to such matters, or agree to a statement thereof made on the record by the Hearing Officer.

Section 3730.208 Discovery

a) Hearing Officer

- 1) The Hearing Officer may order production of documents or things, depositions, or interrogatories in his discretion upon the written request of any party or by the Department on its own motion, either by an order directed to a party or by subpoena directed to a non-party, where:

- A) necessary to expedite the proceedings;
- B) to ensure a clear or concise record;
- C) to ensure a fair opportunity to prepare for the hearing; or
- D) to avoid surprise at the hearing.

- 2) The Hearing Officer shall restrict such discovery where necessary to prevent undue delay or harassment.

- b) The Hearing Officer may in his discretion order the following discovery upon written request of any party:

- 1) a list of witnesses who are known to the party, who have knowledge of the occurrence, or other relevant facts;
 - 2) a list of expert witnesses who may be called at the hearing, which shall be submitted to all parties prior to the hearing; and
 - 3) reasonable inspection of the premises by experts.
- c) Any person, including a party, who is deposed, interrogated or required to submit documents or things under these rules may be examined regarding any matter, not privileged, which is relevant to the subject matter of the pending case, or which

may lead to the discovery of such relevant information.

d) All depositions and interrogatories taken pursuant to this rule shall be for purposes of discovery only, except as herein provided. Such depositions and interrogatories may be used for purposes of impeachment and as admissions of the deposed or interrogated party. Upon application to the Hearing Officer either before or after the taking of such deposition or interrogatories and upon showing that at the time of the hearing, the party deposed or interrogated will not be available to participate in the hearing because of death, age, sickness, infirmity, absence from the Northeastern Illinois Metropolitan Region (specifically the counties of Cook, DuPage, Kane, Lake, McHenry and Will), or other exceptional circumstances, the Hearing Officer may order that the deposition or interrogatories be used as evidence in the hearing.

e) Upon transcription of the deposition, it shall be made available to the deponent for examination and signature, unless signature is waived both by him and by the parties who are represented at the deposition. Any changes in form or substance which the deponent desires to make shall be entered upon the deposition by the court reporter taking the same with a statement of the reasons given by the deponent making them. The deposition shall then be signed by the deponent unless the deponent is ill or cannot be found or refuses to sign, in which event the court reporter's certification shall state the reason for the omission of the signature.

Section 3730.209 Admissions

a) Request for Admission of Fact. A party, or the Department on its own motion, may serve on any other party a written request for the admission by the latter of the truth of any specified relevant fact set forth in the request.

b) Request for Admission of Genuineness of Document. A party or the Department on its own motion, may serve on any other party a written request for admission of the genuineness of any relevant documents described in the request. Copies of the documents shall be served with the request unless copies have already been furnished.

c) Admission in the Absence of Denial.

1) Each of the matters of fact and the genuineness of each document of which admission is requested is admitted unless, within 20 days after service thereof, the

party to whom the request is directed serves upon the party requesting the admission either:

- A) a sworn statement denying specifically the matters of which admission is requested or setting forth in detail the reasons why he cannot truthfully admit or deny those matters; or
- B) written objections on the ground that some or all of the requested admissions are privileged or irrelevant or that the request is otherwise improper in whole or in part.
- 2) If written objections to a part of the request are made, the remainder of the request shall be answered within the period designated in the request. A denial shall fairly meet the substance of the requested admission. If good faith requires that a party deny only a part, or requires qualification of a matter of which an admission is requested, he shall specify so much of it as is true and deny only the remainder. Any objections to a request or to an answer shall be heard by the Hearing Officer upon prompt notice and motion of the party making the request.
- d) Effect of Admission. Any admission by a party pursuant to a request under this rule is for the purpose of the pending action only. It does not constitute an admission by him for any other purpose and may not be used against him in any other proceeding.

Section 3730.210 Authority of Hearing Officer

The Hearing Officer shall have the duty to conduct a fair and impartial hearing, to take all necessary action to avoid delay, to maintain order, and to ensure development of a clear and complete record. He shall have all powers necessary to these ends including (but not limited to) the power to:

- a) require, when appropriate, all parties to state their position with respect to any proposal, application, petition, or complaint;
- b) administer oaths and affirmations;
- c) examine witnesses and direct witnesses to testify;

- d) regulate the course of the hearing;
- e) limit the number of times any witness may testify, limit repetitious or cumulative testimony, and establish reasonable limits on the amount of time each witness may testify;
- f) to issue discovery orders pursuant to Section 3730.208;
- g) to issue subpoenas pursuant to Section 3730.212;
- h) conduct hearings and prehearing conferences;
- i) Rule or reserve ruling on the admissibility of evidence and amendments to pleadings;
- j) continue a hearing from day to day or adjourn it to a later date by announcement thereof at the hearing or by appropriate notice thereof to all parties; and
- k) direct parties to enter their appearances on the record.

Section 3730.211 Hearing Procedure

a) General Provisions

- 1) All hearings shall be open to the public.
- 2) All testimony taken at such hearings shall be under oath or affirmation.
- 3) All relevant evidence is admissible if, in the opinion of the Hearing Officer, it is of a type commonly relied upon by reasonably prudent men in the conduct of their affairs. Objections to evidentiary offers may be made and shall be noted in the record.
- 4) In determining the admissibility of evidence, the Hearing Officer shall give consideration to, but not be bound by rules of evidence governing civil proceedings.
- 5) Official notice may be taken of all facts of which judicial notice may be taken and of other facts within the specialized knowledge and experience of the Hearing

Officer. Whenever official notice is requested or the Hearing Officer intends to take such notice on his own motion, prior notice shall be given to all parties with an opportunity to comment on the relevance or accuracy of the material of which official notice may be taken.

- 6) Copies of direct testimony of any witness shall be served upon the Hearing Officer at least 7 days in advance of the session of the hearing at which such testimony is offered.
- 7) All motions and objections made during a public hearing shall be stated orally on the record, including the grounds of such objection.
- 8) When objection is made to the admissibility of evidence, such evidence may be received subject to such other objection and later ruling.
- 9) All motions other than those made during a hearing shall be in writing and shall state briefly the order or relief applied for and the grounds for such motion. Any such motion shall be filed with the Hearing Officer and a copy thereof shall be served at the same time on the parties. Answering statements, if any, shall be filed in writing with the Hearing Officer within 5 days after service of the motion upon the party filing the answering statement, and a copy thereof shall be served within the same period upon the other parties. The Hearing Officer may in his discretion, call for oral arguments on any such motion.
- 10) Parties may agree by stipulation upon facts involved in the proceeding. Any stipulation reached before a final determination by the Director shall be submitted in writing to the Hearing Officer and shall become effective only if approved by the Hearing Officer.
- 11) Statements from interested citizens may be presented if authorized by the Hearing Officer. These statements are subject to the same Rules and Regulations as herein set forth.
 - b) Cross-Examination
 - 1) Upon the hearing of any action any party thereto or any person for whose immediate benefit the action is prosecuted or defended, or the officers, directors or managing agents or any party to the action, may be called and examined as if under cross-examination at the instance of any party. The party calling for the

examination is not precluded from rebutting the testimony thus given by counter testimony and may impeach the witness by proof of prior inconsistent statements.

2) If the Hearing Officer determines that a witness is hostile or unwilling, he may be examined by the party calling him as if under cross-examination.

3) The scope of cross-examination shall be defined by those issues relevant to the Director's determination.

4) Repetitious cross-examination may be limited by the Hearing Officer.

c) Documentary Evidence

1) The Hearing Officer may receive material and relevant evidence which would be relied upon by reasonably prudent persons in the conduct of serious affairs which is reasonably necessary to resolution of the issue for which it is offered; provided that the rules relating to privileged topics shall be observed.

2) the Hearing Officer shall exclude immaterial, irrelevant, and repetitious evidence.

3) When the admissibility of disputed evidence depends upon an arguable interpretation of substantive law, the Hearing Officer shall admit such evidence.

4) Upon stipulation of the parties, the Hearing Officer may order the record of any relevant prior proceeding before the Department incorporated into the record of the present proceeding. In such an event, the Hearing Officer shall incorporate the entire or appropriate portions of the record constituting such prior proceeding into the present proceeding.

5) Relevant scientific or technical articles, treatises or materials may be introduced into evidence subject to qualification of the author and subject to refutation or disputation through any introduction of comparable documentary evidence or expert testimony.

6) When a party desires to offer in evidence any portion of the record in any other proceeding or previously filed applications, such portion or application shall be offered in the form of an exhibit unless objected to or otherwise stipulated by the

parties. Upon objection such materials may be submitted for admission pursuant to sub-section c(9) of this section.

7) When any material or relevant matter offered in evidence by any party is embraced in a book, paper or document containing other matter not material or relevant, the party offering the same shall plainly designate the matter so offered. If, in the judgment of the Hearing Officer, such immaterial or irrelevant matter would unnecessarily encumber the record, such book, paper or document will not be received in evidence as a whole, but the material or relevant portions thereof, if otherwise admissible, may be read into the record or a true copy thereof supplied in the form of an exhibit.

8) When an exhibit of a documentary character is marked for identification and offered in evidence, four copies thereof shall be furnished to the Hearing Officer and one copy to each party who requests a copy unless the Hearing Officer rules otherwise. Copies will be retained by the Hearing Officer and the Department.

9) When a party desires to offer in evidence any evidence heretofore considered in the issuance of a previous allocation order, such evidence shall be reintroduced by the proponent thereof provided said proponent has a witness or witnesses available who will state under oath that such evidence represents his testimony and is subject to cross-examination.

d) Depositions. During the pendency of any proceeding, the Hearing Officer either upon his own motion or upon application in writing by any party may cause the deposition for use as evidence in the proceeding of any witness within or without the State to be taken in the manner provided by law for depositions in civil actions in the course of this State, and to that end may compel the attendance of witnesses and the production of books, papers, accounts and documents. Except under special circumstances and for good cause shown, no deposition may be taken except upon 10 days prior notice to all parties.

e) Postponement or Continuance of Hearing.

1) A hearing may be postponed or continued for due cause by the Hearing Officer upon his own motion or upon motion of a party to the Hearing.

2) Notice of motion for postponement or continuance shall be given in writing, by the party requesting the motion, to all parties to the hearing within a reasonable

time in advance of the previously scheduled hearing date.

f) Default. Failure of a party to appear on the date set for hearing, or failure to proceed as ordered by the Hearing Officer shall constitute a default. Within 30 days after notice to the party of the default order and upon good cause being shown, the party may move to vacate the default and be allowed to proceed as if no default had been entered. Upon default the Director shall enter such order as is appropriate based upon the evidence introduced at the hearing.

Section 3730.212 Subpoenas

a) Pursuant to Section 10 of the Act, upon verified application to the Hearing Officer by any party and upon a showing that such subpoena is reasonably required, or on motion of the Hearing Officer, the Hearing Officer shall issue a subpoena for attendance at a deposition or a hearing, which may include a command to produce books, papers, documents, or tangible things designated therein and reasonably necessary to resolution of the matter under consideration, subject to the limitations on discovery prescribed by these Rules.

b) Every subpoena shall state the title of the action and shall command each person to whom it is directed to attend and give testimony at the time and place therein specified.

c) The Hearing Officer, upon motion made promptly and in any event at or before the time specified in the subpoena for compliance therewith, may quash or modify the subpoena if it is unreasonable and oppressive.

d) Any person served with a subpoena issued in accordance with these rules who shall refuse or neglect to appear or to testify, or to produce books, papers, accounts or documents as commanded in such subpoena shall be guilty of a Class B misdemeanor.

Section 3730.213 Official Record

a) The Department shall provide a court reporter who shall record and transcribe a stenographic record of all hearings and will provide for such copies of the transcript as the Department may require for its own purposes. For hearings commencing after May 12 1980, the obligation to provide a record shall be the petitioner's.

- b) After the transcript is filed, the Hearing Officer shall entertain requests for corrections and enter corrections either on the record of a subsequent hearing or in an Order.
- c) The transcript of the hearing, all pleadings, all exhibits entered into evidence, and any documents officially noticed pursuant to Section 3730.211(a)(5) shall constitute the record.
- d) Transcripts of hearings conducted by the Department shall be kept in the custody of the Department and will be open for inspection during the regular office hours. Copies may be made at the expense of the interested party.

Section 3730.214 Order of Hearing Officer or Director

The Hearing Officer's findings and recommended order shall be presented to the Director for his approval. The Director may issue the recommended order as his own or he may modify the recommended order or reconsider the order or order a rehearing. Any party may petition the Director for reconsideration or for a rehearing within 30 days of the issuance of the Director's order. A copy of the order or decision of the Director shall be filed in the records of the Department and served on each party to the proceeding. Any order and decision of the Director shall be open for public inspection at his offices during regular office hours.

Section 3730.215 Hearing Officer's Proposed Order

Prior to, during or following the taking of testimony, the hearing of oral argument and the filing of briefs, if any, filed with him by the parties, the Hearing Officer may require filing of proposed orders including proposed findings of fact and conclusions of law.

SUBPART C: ALLOCATION RULES

Section 3730.301 Allocation Permits

- a) No regional organization, municipality, political subdivision, agency or instrumentality, or any other organization, association or individual desiring to use water from Lake Michigan which is subject to allocation under the Act shall divert or use any such water after July 1, 1977, unless it has previously obtained from the Department a valid allocation permit.

- b) The Department shall issue an allocation permit to any applicant which it determines to be entitled to an allocation of water from the Lake Michigan diversion according to the criteria set out in this Subpart. The permit shall state the allocation which the applicant is allowed, the starting date and duration of the permitted allocation, and such conditions as specified in Sections 3730.307 and 3730.309 as the Department may require the applicant to comply with in order to receive or to continue to receive its allocated share of the Lake Michigan diversion. Allocations for residential, industrial and commercial uses will be limited for each annual accounting period. Allocations for navigational makeup and discretionary dilution will be limited by a running average over five annual accounting periods. Allocations for lockage and leakage will be limited by a running average over 40 annual accounting periods.
- c) If, over a five-year running period, a permittee appropriates water in amounts which are greater than 105% of its allocation for that period or if it appropriates in excess of 115 percent of its allocation in any one annual accounting period, the Department shall issue a notice of violation of the allocation permit.
- d) If a permittee commits a permit violation under subsections (a), (b) or (c) or if it fails to observe the conditions attached to its allocation permit, the Department shall issue a notice of violation. Upon hearing and determination of said violation, the permittee shall be deemed to have failed to obey an order made by the Department and may be subject to a fine of not less than \$1,000 or not more than \$10,000 to be recovered in the name of the People of the State of Illinois in any court of competent jurisdiction. Each day in which the prohibited activity continues shall constitute a new and separate violation of a Department order.
- e) If over a five-year running period, a permittee appropriates water in amounts which are less than 90% of its allocation for the period, any entity or the Department on its own motion may initiate proceedings for a modification according to Sections 3730.204(c) and 3730.310. Any such modification shall be preceded by notice as provided in Section 3730.206 and a hearing held in conformance with Subpart B.
- f) If a permittee, because of physical limitations, cannot use an allocation, the Department may allocate this water after notice and a hearing to another use during an accounting period or hold it in reserve for future use without prejudice to any permittee's allocation in succeeding accounting periods.

(Source: Amended at 14 Ill. Reg. 1484, effective January 3, 1990)

Section 3730.302 Application

An application for an allocation permit shall contain the following information, to be filed on forms provided by the Department:

- a) The name and location of the applicant;
- b) A description of the geographic area which the applicant supplies or intends to supply with water, and the number of people residing within that area;
- c) An enumeration of the uses to which the allocation is intended to be put, including the proportion of the allocation which goes to each use;
- d) A description of all proposed and existing systems for the storage, treatment, transportation and distribution of water and the location of any discharge of wastewater effluent within the area which the applicant intends to supply with water from the allocation, including the location, dates of construction, and major improvements of wells;
- e) A description of all present sources of water supply, within the area described pursuant to Section 3730.302(b), including a breakdown stating the amounts and quality of water currently available and the quantity prospectively available from each source;
- f) A statement of anticipated future needs during the period for which application for a water allocation is being made, including projected land use changes and population changes and per capita use.
- g) Such other information relevant to the Lake Michigan allocation as the Department deems appropriate.

Section 3730.303 Classification of Water Users

- a) Applicants will be divided into broad categories determined by water use. The categories in order of descending priorities are: Categories IA and IB having the

same priority, Categories IIA and IIB having the same priority, and Category III.

- 1) Category IA - Applicants whose primary water needs are residential, commercial or industrial and whose future or continued use of Lake Michigan water is the most economical source of supply.
 - 2) Category IB - Applicants whose primary water demands are for the minimum flows necessary to meet navigation requirements and minimum discretionary dilution flows necessary to maintain the Sanitary and Ship Canal in a reasonably satisfactory sanitary condition.
 - 3) Category IIA - Applicants whose water demands are for the minimum discretionary dilution flows necessary to meet water quality standards in the Sanitary and Ship Canal.
 - 4) Category IIB - Applicants whose primary water demands are residential, commercial and industrial and whose use of Lake Michigan water would reduce regional use of the deep aquifer.
 - 5) Category III - Applicants whose water demands do not fall into Category IA, IB, IIA, or IIB.
- b) In determining priorities within Categories IA and IB, the Department will consider the following items:
- 1) Adequacy of supply from sources other than Lake Michigan.
 - 2) Economics of alternative supplies.
 - 3) A limitation of 320 cubic feet of water per second for discretionary dilution for water quality purposes in the Sanitary and Ship Canal.
 - 4) The need to maintain the Sanitary and Ship Canal in a reasonably satisfactory sanitary condition.
 - 5) For new users or applicants who have requested an increase over the allocation of Lake Michigan water which these applicants had on July 1, 1980, priority will be given to allocations for domestic purposes.

- 6) The need to meet navigation requirements in the Sanitary and Ship Canal.
- 7) The requirement that the Department shall not allocate less than 320 cubic feet per second for discretionary dilution for water quality purposes in the Sanitary and Ship Canal before October 1, 2000, unless a modification is ordered based on the criteria stated in Section 3730.310(b)(4).
- c) In determining priorities within Categories IIA and IIB, the Department will consider the following items:
 - 1) A limitation of 320 cubic feet per second for discretionary dilution for water quality purposes in the Sanitary and Ship Canal.
 - 2) The requirement that the Department shall not allocate less than 320 cubic feet per second for discretionary dilution for water quality purposes in the Sanitary and Ship Canal before October 1, 2000, unless a modification is ordered based on the criteria stated in Section 3730.310(b)(4).
 - 3) The need to meet water quality standards in the Sanitary and Ship Canal.
 - 4) For new users or applicants who have requested an increase over the allocation of Lake Michigan water these applicants had on July 1, 1980, allocations of Lake Michigan water will be made with the goal of reducing withdrawals from the Cambrian-Ordovician Aquifer.
 - d) The Department will normally make allocations to meet the full water needs of any category as determined by the Department before any water is allocated to applicants in categories of the lower priority.
 - e) In determining the amount of water available for allocations to Categories I, II, & III, the Department will consider the amount of water that must be reserved for storm water runoff, and a reserve for future increases in demands and storm water runoff.

Section 3730.304 Water Needs Criteria

The Department will determine anticipated water needs for each applicant. The Department will take into consideration in making such determination the

population of the area to be served, projected population growth, current and projected per capita consumption within the area, the nature and extent of industrial uses (including a consideration of typical requirements for similar industries), municipal and hydrant uses (public facilities, park upkeep, fire protection), implementation of conservation practices, and the reduction of unaccounted-for flows as required by these rules.

a) Conservation practices which will be considered with respect to applicants in Categories IA and IIB include the extent of metering, the provision of building codes for water efficient equipment, rate structures which encourage conservation, past record of enforcement of water saving ordinances, expenditures for maintenance and repair of water distribution systems, and implementation of specific ground water conservation levels of usage recommended by State or regional planning agencies. The Director may establish maximum reasonable per capita consumption rates for each user based upon either an evaluation of the relative proportion of industrial, commercial and residential users served by the permittee or the efficiency of the permittee's water distribution system, or both. Unaccounted-for flows for applicants in Categories IA and IIB shall not exceed 12% in 1981 decreasing to 8% in 1986 and for all years thereafter except as provided in Section 3730.307(b). The percentages stated in this Section shall be based on net annual pumpage.

b) Conservation practices which will be considered with respect to applicants in Categories IB and IIA include improved and more accurate measurement and accounting procedures, improved treatment of all waste flows, elimination of untreated combined sewer bypass flows, reasonable use of instream aeration, impoundment or other methods to provide for the reuse of lockage water, regulation of lock usage, implementation of navigational and storm response operations and procedures to minimize Lake Michigan diversion and implementation of effective programs of leak prevention, detection and correction.

Section 3730.305 Emergencies

a) Upon the occurrence of an unforeseen event and where necessary to safeguard the health, safety, or welfare of the people of the State of Illinois, the Director shall make an emergency allocation of water upon a showing by any user or applicant that:

1) *A water shortage emergency exists, threatening the public health, safety, or*

welfare of people whom the user or applicant intends to supply with water; and

- 2) the user or applicant is making provisions to prevent the continuation or recurrence of such emergency allocations by developing alternative sources of water supply.
- b) The effectiveness of an emergency allocation order shall last until the Department has issued and entered an order after a hearing regarding the emergency allocation is held in accordance with Section 3730.202(d).
- c) All hearings on emergency allocations will be held after notice has been given pursuant to Section 3730.206(a).

(Source: Amended at 9 Ill. Reg. 386, effective January 1, 1985)

Section 3730.306 Transfer of Water Use Rights

- a) A user may not transfer any portion of its allocation of Lake Michigan water to another user unless the transferor has satisfied all of the conditions precedent attached to its water allocation permit and the Department has approved the transfer according to the procedures in subparagraph (b) or (c) of this Section.
- b) All requests for transfers, except those described in subparagraph (c) of this Section, shall be processed as petitions for modification of the allocation permits of the transferor and the transferee according to Sections 3730.204(c) and 3730.310. These requests shall not be approved or disapproved unless notice has been given as provided in Section 3730.206 and a hearing has been held in conformance with Subpart B of this Part.
- c) Any request for a transfer which includes the following statements may be approved by the Department after 30 days notice to all permittees and an opportunity for hearing has been provided:
 - 1) The transferor must have satisfied all of the conditions precedent attached to its water allocation permit.
 - 2) The transferee must be a duly constituted regional water supply organization.

- 3) the transferor and transferee must clearly indicate that the transferee assumes responsibility for compliance by the transferor with the requirements of Sections 3730.307 and 3730.309.
- 4) The requested transfer must comprise 100% of the transferor's allocation.
- 5) The transferred allocation must be used solely by the transferor.
- d) Transfers to another user of any part of an allocation, except those transfers described in subparagraph (c) of this Section, will be considered prima evidence of a reduction in the transferor's water use needs equivalent in size to the transferred allocation when the transferor applies for a renewal permit. However, evidence that an applicant has obtained additional Lake Michigan water from other users beyond that amount originally allocated to the transferee will not be sufficient to establish a prima facie case that the transferee-applicant's original allocation should be increased by a corresponding amount.
- e) All transfers terminate upon the expiration of the transferor's allocation permit.

Section 3730.307 Conservation Practices and Other Permit Conditions

- a) The Department shall condition allocations within a user category upon required conservation practices for each user category as specified in subsections (b) and (c). Failure by any permittee to meet the conservation requirements applicable to it within a reasonable period of time will, upon notice, hearing and determination of such failure, constitutes a violation of a Department order.
- b) As a condition of receiving an allocation of Lake Michigan water, all permittees will agree to submit to the Department proposals designed to reduce or eliminate wasteful water use and to reduce unaccounted-for flows to 8% or less, based on net annual pumpage, and procedures used to determine efficiency of water metering or accounting in permittee's system.
- c) The Department shall require evidence of adoptions by the permittee of the following conservation practices as applicable to the particular user:
 - 1) Leakage monitoring and correction for storage, transmission and distribution systems.

- 2) Metering of all new construction.
- 3) Metering of existing nonmetered services as part of any major remodeling.
- 4) The adoption of ordinances which require installation of the following water efficient plumbing fixtures based on a pressure at the fixture of 40 to 50 psi in all new construction and in all repair or replacement of fixtures or trim:
 - Fixtures Maximum Flow
 - Water Closets, tank type 3.5 gal per flush
 - Water Closets, flushometer type 3.0 gal per flush
 - Urinals, tank type 3.0 gal per flush
 - Urinals, flushometer type 3.0 gal per flush
 - Shower Heads 3.0 GPM
 - Lavatory, sink faucets 3.0 GPM
- 5) The adoption of ordinances which require the installation of closed system air conditioning in all new construction and in all remodeling.
- 6) The adoption of ordinances which require that all lavatories for public use in new construction or remodeling be equipped with metering or self closing faucets.
- 7) The adoption of ordinances which require that all newly constructed or remodeled car wash installations be equipped with a water recycling system.
- 8) The adoption of ordinances which restrict non-essential outside water uses to prevent excessive, wasteful use. As a minimum, these restrictions shall provide that unrestricted lawn sprinkling will not be allowed from May 15 - September 15 of each year.
- 9) Development and implementation of public programs to encourage reduced water use.

- 10) Installation of facilities and implementation of programs to reduce to a reasonable minimum, and to accurately account for, water used for navigational, lockage, and leakage purposes; and pollution treatment, control or abatement purposes.
- d) Within 90 days of receipt of an allocation permit, each permittee which uses any water from deep aquifer pumpage shall submit a phased program designed to end this practice, other than for emergency or standby use, within five years of the receipt of Lake Michigan water.
- e) As a condition of receiving an allocation of Lake Michigan water, all permittees will limit hydrant uses to 1% or less of net annual pumpage in each annual accounting period. The Department may grant an exception to this requirement if it can be shown by the user that this requirement can't be met. In determining the merits of a request for an exception, the Department considers such factors as engineering studies of hydrant uses and unusual circumstances during an annual accounting period.
- f) The Department recommends that all permittees adopt water rate structures based on metered water use and that water rate structures be developed which will discourage excessive water use.

(Source: Amended at 14 Ill. Reg. 1484, effective January 3, 1990)

Section 3730.308 Duration of Permit and Renewals

- a) The Department shall determine the duration of each allocation permit, which shall be stated upon the face of the permit.
- b) At the expiration of each allocation permit, the permit shall be renewed year by year in the same amount and on the same conditions as were in force upon expiration of the permit, unless any entity, or the Department on its own motion, files a petition for modification in compliance with Section 3730.204 (c) and 3730.310 and the Department determines that the petition is not frivolous. A permit shall remain in force and effect pending a determination by the Department of the issues raised in the modification proceedings.

Section 3730.309 Reporting Requirements

a) Within 60 days of the end of each accounting period, all permittees shall furnish the following information and such other information relevant to the Lake Michigan allocation as the Department may require on forms provided by the Department:

- 1) Total water use from all sources for the accounting year and the percentage of water distributed through metered services;
- 2) Average daily water use by month from all sources for the accounting year;
- 3) Maximum and minimum daily pumpage from all sources for the accounting year and the dates of these events;
- 4) Total pumpage from Lake Michigan, shallow aquifer wells, and deep aquifer wells, including the number and location of each well, and the percentage of total water use for the accounting year from each source;
- 5) Individual well production rates for the accounting year including well numbers, average pumping rates, and average number of hours pumped per day;
- 6) For each well a list of all parameters which exceed the standards in 35 Ill. Adm Code 601-607;
- 7) A list of which wells, if any, interfere with each other during simultaneous pumping;
- 8) A description of any problems anticipated from any well supply during the next accounting period;
- 9) The amount and percentage of water from all sources for the accounting period used for each of the following purposes:
 - A) Residential,
 - B) Industrial and commercial,
 - C) Municipal use,
 - D) Firefighting and training,

- E) Water main flushing,
- F) Sewer flushing,
- G) Street cleaning,
- H) Public and private construction,
- I) Leakage,
- J) Lockage,
- K) Storm water runoff,
- L) Navigational makeup,
- M) Discretionary diversion,
- N) Unmetered services,
- O) Unaccounted for, and
- P) Unavoidable leakage, and
- Q) Other identified uses;
- 10) Summaries of the results and recommendations of any leak surveys conducted in the accounting period;
- 11) Amounts transferred and sources of all water sold or otherwise provided to any other named distribution system during the accounting period;
- 12) A copy of the current water rates for all consumers including an indication whether each water rate structure is declining, flat, or increasing, and
- 13) The name, address and telephone number of the person the Department should contact if further information is needed.

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